COAL AGE

Vol. 12 NEW YORK, OCTOBER 6, 1917 No. 14

Look Ahead—Forget the Past

YESTERDAY IS GONE. It's happenings are now history; they cannot be changed.

Hope commences with the early rising sun. Today's mistakes have not been made; it rests with us not to make them.

Look on the bright side. Even pain is only the effort of nature to restore health; trials are but necessary forms of correction and discipline. No one is ever beaten until he is first discouraged. Hope is the parent of all endeavor; it turns mountains into plains. He who has hope has everything.

Yesterday you were weak—today be strong. Yesterday you loafed and made but half an effort—today give all that's in you. An accident was your fault—be careful. You were impatient and spoke harshly—be kind. You passed snap judgment and worked an injustice—be deliberate; act wisely; be fair.

We are taught by our mistakes. Only cowards lay down today because of yesterday's failures. Don't be a coward. Make your errors stepping-stones.

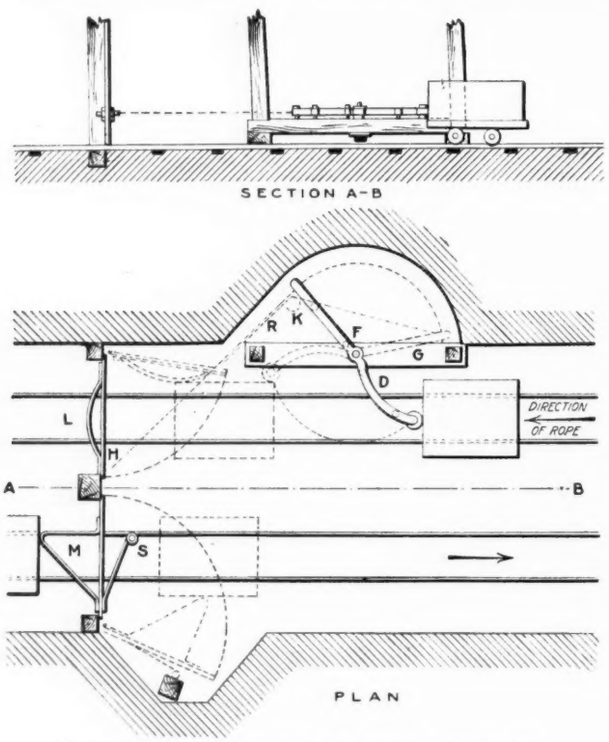
You say your company doesn't appreciate you. Why should they? What have you done to prove you are not one of the common herd? Have you worked longer hours and been more loyal and efficient than the others? Have you been quick to forgive and always ready to help?

Every morning sun brings a new opportunity. Heads up! Look toward tomorrow and forget yesterday! We live in a land where the poorest human can become a nobleman. Here we are noble if we act noble; birth is no barrier.

Ideas and Suggestions

Self-Acting Mine Door from Wigan

The illustration herewith shows a self-acting mine door of home manufacture used in the mines of the Wigan Coal and Iron Co., in England, where endless rope haulage is in use. It is obvious that it can be adopted wherever the movement on any road is always in one direction. However, with a trifling modification



DOOR DISPENSING WITH TRAPPER'S SERVICES

it could be made to work just as acceptably whatever the direction of traffic might be.

To pull the door open toward the approaching trip the bar *D* is provided, which turns on the strong pin at *F*, which pin passes through and is secured to the beam *G* set to the gradient of the road. The ends of the beam are secured by props.

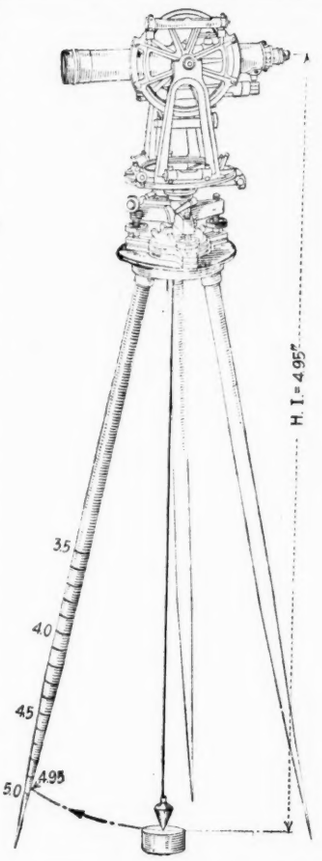
The end of the bar *D* which projects over the road along which the trip passes has a small wheel fitted to it which rolls on the front of the leading car in contact with it, the bar being set above the level of the clip on the rope where rope haulage is used. The other end of the bar has holes drilled in it, and through one of these, selected after trial and modified to suit necessity, the rope *R* is attached.

Passing round the roller *K*, the rope is fastened to the door at *H*. An iron bow *L* is attached to the door so that it cannot drop back between the cars on the trip. The arrangement is such that the door cannot close till the last car of a trip has passed through. As soon as that has happened the door closes by gravity.

The lower part of the plan shows how the door that accommodates the traffic on the other return track is pushed open by the first car of a trip and held in place till all the cars have passed through. Bolted to the door is the iron bar *M*. It catches the car before the clip on the rope reaches the door. A spring *S* is fixed on the back of the door. This is compressed by the cars in the trip, and it starts the door back into place as soon as the cars have passed, the door being hung so that it closes by gravity as soon as it has passed the point of perpendicularity. For the illustration and information acknowledgement must be made to the *Iron and Coal Trades Review.*

Read Transit Height on Tripod Leg

In a recent issue of the *Engineering News-Record* William Halvernberg recommends that a scale be marked off on one of the legs of all transits used for stadia determinations, this scale being arranged to show the height of the eyepiece of the transit above the level of the station when a reading is taken. This reading is secured by deflecting the plummet from the head of the station to its appropriate point on the leg. The plummet, of course, must first be adjusted so as to almost touch the tack in the station. The string by which it is suspended must not be too easily extensible when handled and must not be disposed to slip at the point of suspension. Given a string of this character, it is easy to graduate the leg of any transit for future measurement. The level of one station is first determined relative to that of some other station. The instrument is then set up and leveled over the first station, and the height of the eyepiece above the other station determined. The height of the station over which the instrument is set being known, the height of the eyepiece of the instrument above the station over which it stands is easily and accurately



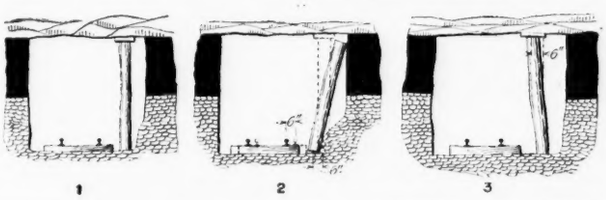
HEIGHT OF INSTRUMENT HEAD FROM TRIPOD LEG

determined. The plummet is lowered to the top of the station, and then gently swung over to the transit leg. By setting the transit to another level and determining another point on the leg for another transit height, it is possible to obtain by interpolation a series of intermediate values from which the transit height may be determined with only small error.

Movement of Clay Displaces Props

By R. Dawson Hall

Posts are sometimes set along a haulage road when it is overcome by a squeeze, to assist in supporting the roof. It is needless to consider how they should be placed under those circumstances, because they should not be used at all for that purpose. Should it be desirable, however, to place them for the purpose of preventing the drawslate from falling, then it is necessary to consider how they should be placed so that they will not be dislodged.



WHAT HAPPENS TO PROPS ON A SQUEEZING HEADING AND HOW TO AVOID DIFFICULTY

Fig. 1 shows such a prop in a mine heading where the squeeze is approaching from the right side. The action of the clay on the prop is of two kinds: (a) The clay rib is pushed out and may push the post over, or (b) the clay under the prop is moved over and this displaces the foot of the prop with a like result. The tie also may be moved over by the same action, the track being heaved at the same time. As a result the post will cease to be vertical and will fall back against the rib, as in Fig. 2. In a long heading I have seen over a hundred props set for the improper purpose of stopping a squeeze, one and all lying back against the rib. Of course, the mine foreman did not see fit to erect them a second time.

If, however, they were really needed, they could have been placed as in Fig. 3, inclined to the vertical so that the movement of the clay would tend to wedge them more firmly into position. They would then tend rather to break than to fall.

A Tack Map for Superintendents

By H. D. Easton

General Superintendent, Federal Coal Co., Straight Creek, Ky.

The superintendent of coal mines needs all the first-aid-to-efficiency devices that may fit his mining conditions. One of these aids, which is especially useful where a group of old mines is to be managed, is that of a tack map such as is shown in the illustration.

I am in charge of a group of mines that have been worked in a haphazard manner: Men were scattered over fan-shaped areas with vast quantities of steel and copper in use where but a fraction of the amounts employed would have been adequate had the mines been worked according to some practical plan. Large areas of coal were left surrounded by robbed sections, and many entries were driven with no rooms developed while others farther from the mine entrance were worked out and robbed here and there.

As an aid in concentrating the workings, cleaning up the neglected areas, shortening hauls, recovering superfluous steel and copper, etc., I hit upon the plan of making a tack map so as to have a clear picture immediately available showing just where each working place is. This tack map has proved quite useful, since it shows from week to week what progress is being made in concentrating men and using equipment to the best advantage.

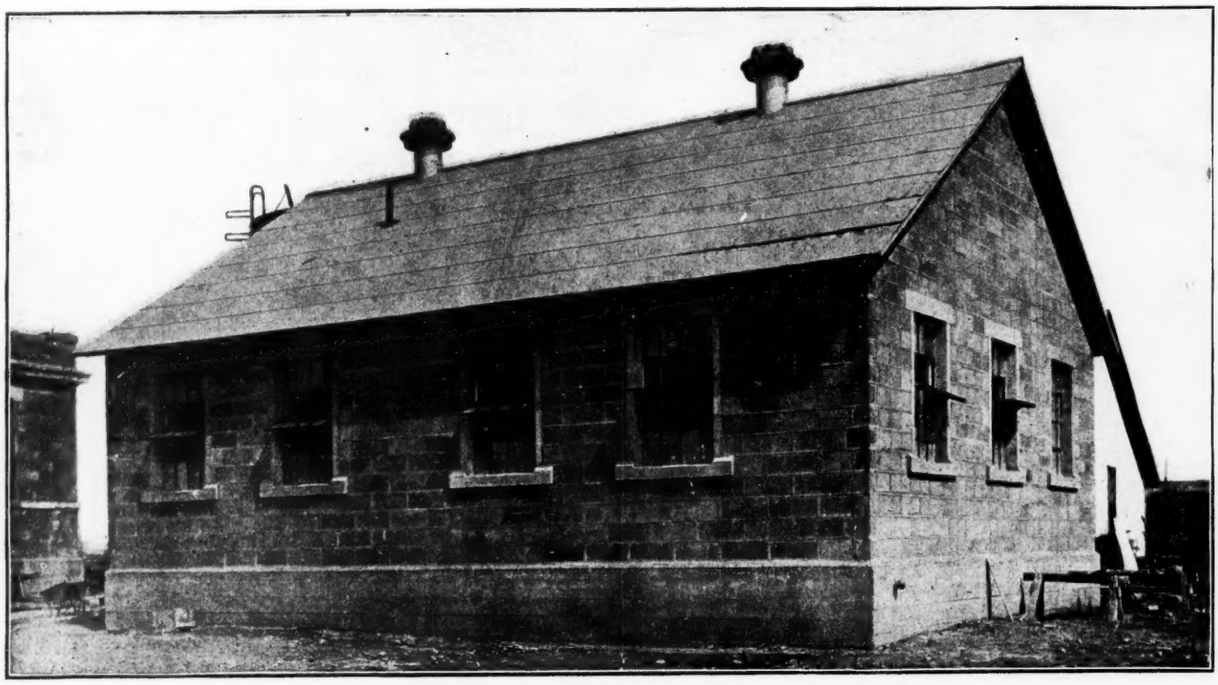
Moore push-points in different colors are used, the scheme of colors, or legend, being: Blue, for narrow work, such as entries and aircourses; red, for rooms; white with black eye, for robbing work; orange, for air punchers; yellow, for electric mining machines; purple, for pumps; black, for siphons; white, for fans; and green, for sidetracks.

A single blueprint map, showing five mines on a scale of 300 ft. to the inch, is fastened to a board background on an easel so as to be easily moved. This arrangement places the tack map within reach so it can be studied and the tacks shifted about to keep pace with changes inside the mines.

ILLUSTRATION OF TACK MAP

The daily mine foreman's reports are provided with a place for noting information for the engineering department, members of which are required to keep all mine maps up to date, give sights for all new rooms and immediately measure up and map every worked-out place. Each foreman is instructed to write on his daily mine report "sights needed" and "places driven up," and the engineers must note these things from the reports, which are kept on file in the shipping office at the desks of the assistant superintendent and the chief mine foreman. The engineers move the tack on the map each week.

While tack maps are in use for a variety of purposes, I have never known one to be employed before to keep track of working places in coal mines. This scheme has proved its utility here and can be used to advantage by others who have to straighten out haphazard workings. It would doubtless prove handy for any mine.



EMPLOYEES' LOCKER AND WASHROOM CONSTRUCTED THROUGHOUT OF CONCRETE

Uses of Concrete in Coal Mines

THE increasing scarcity of wood of suitable size, together with the present high prices of both wood and steel occasioned by the immense governmental demand for these materials, serves again to emphasize the practicability of concrete in mine work and the superior qualifications it possesses for construction purposes.

The fireproof qualities of concrete eliminate the great danger of disaster from burning mine structures. Its waterproof qualities prevent the trouble caused by seepage of water into shafts and mines. Its explosion-proof qualities reduce the danger of gas explosions. Its permanence eliminates the expense of renewals, repairs, maintenance and depreciation.

The concrete-built mine is in the long run the cheapest, as well as the safest and most efficient. A few of the principal applications of concrete to mine work deserve particular mention.

Lining Shafts with Concrete

Concrete is now recognized as the best material for the lining of mine shafts and is approaching almost universal use for that purpose in this country. It is also rapidly displacing other forms of shaft lining in European and South African mines.

The reasons for this are: First, that the concrete lining is fireproof. Second, it is waterproof and the troubles due to seepage with other forms of linings are permanently eliminated. Third, it is permanent and need not be replaced or repaired during the life of the mine. Fourth, it can be adapted to any form of shaft. This need not be limited to any certain shape on account of the rigidity of the lining material. A concrete-lined shaft may be square, circular, elliptical, oblong or a combination of all these shapes in its cross-section, as occasion may require.

One method of lining shafts with concrete is to line the shaft in successive sections of suitable height, the work being done at the time the shaft is sunk. When the sinking has progressed sufficiently to make a workable job of concreting, substantial forms of wood or steel are built and the bottom opening between the form and the rock is sealed. The annular space between the form and the surrounding rock or earth is then filled with concrete from above, the mixer, if one is used, being placed on the surface in close proximity to the shaft opening. The concrete is either shot from the mixer through a pipe into a hopper emptying directly into the forms, or, as is the usual method, lowered in buckets to a platform or hopper at the top of the forms. When the forms have been entirely filled they are left in place until the concrete has hardened. Thereupon they can be removed, cleaned, and again used for the next lower section when this has been excavated. This operation is repeated until the bottom of the shaft has been reached. In this method the greatest care must be exercised that the closure joint of one section to the one next above is made watertight.

In some instances, notably in the case of relining old shafts, the lining is done from the bottom of the shaft upward, the old lining being removed from below as the placing of new lining progresses. In every other particular this method is similar to the one described above. This method may also, under certain conditions, be used in lining new shafts, but would be limited to cases where no trouble is encountered from excessive seepage or from slipping of the soil.

Concrete "timbers" are used for the replacement of the wooden timbers in mine shafts where it is not desirable to employ the monolithic type of concrete lining. These timbers are pre-molded on the surface, and after

thorough seasoning are taken into the shaft and put into position. The "timber" may be square, rectangular or T-shaped in cross-section and the ends so formed that the "timbers" will interlock and hold each other firmly in place.

In the case of existing shaft linings of wood or steel, when it is desired to increase their fire-resisting and waterproof qualities without replacing the lining itself, this may be done by inclosing the existing wood timbers in a cement plaster on wire netting or expanded metal. The mortar can best be applied by means of the cement gun or some similar apparatus.

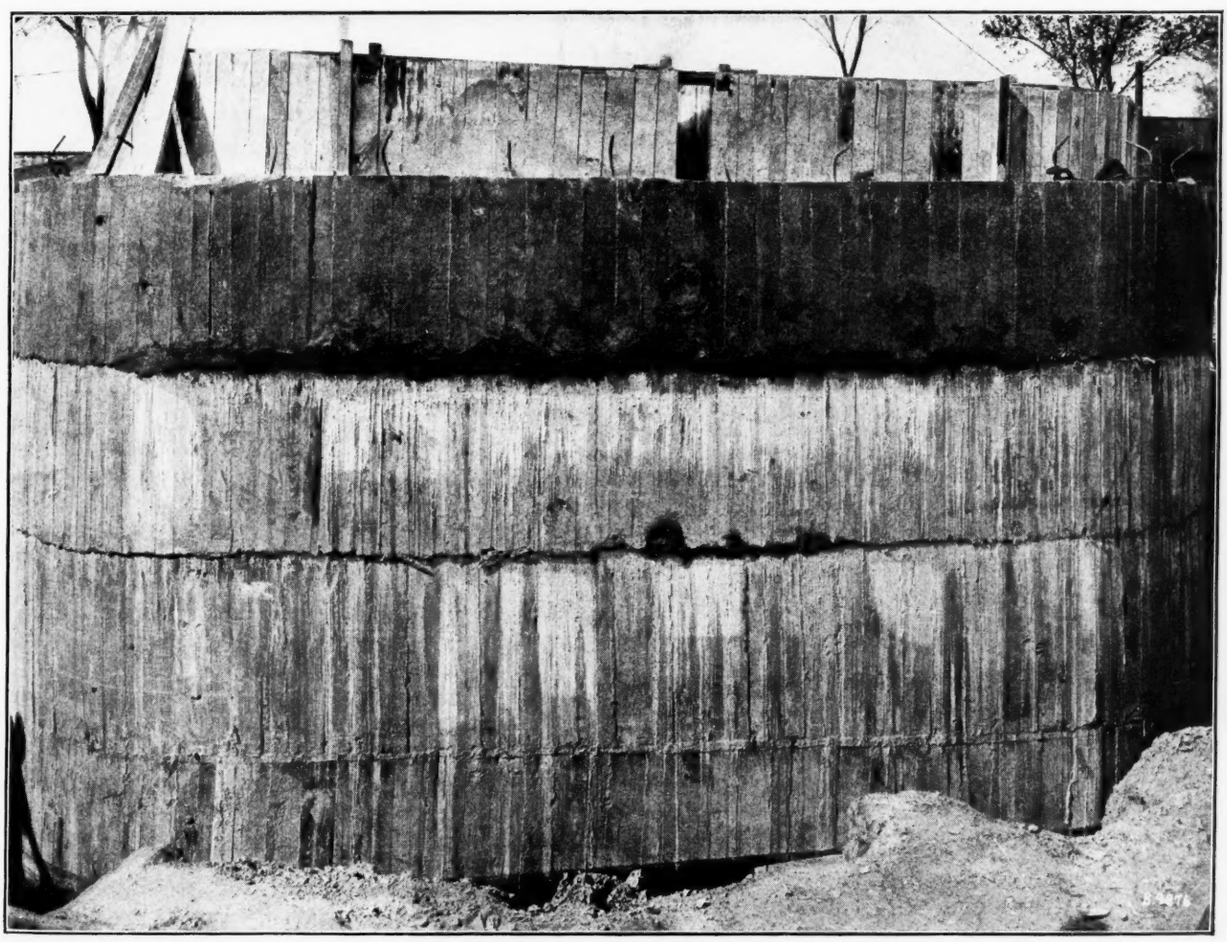
Cementation Process Described

In shaft sinking if a water-bearing stratum is encountered, the difficulty may be overcome by means of a process first developed in France and now known as cementation. This process consists of drilling a number of holes through the water-bearing stratum and arranged in a circle surrounding the shaft site. Into these holes is then pumped a cement grout until the rock fissures are entirely filled. When this grout has set the sinking may proceed and no further trouble will be experienced from that stratum.

A novel and efficient method of lining mine shafts from the top downward at the time of sinking has been devised by a Scotch mining engineer. This consists of the successive interlocking of sections of pre-molded reinforced-concrete blocks, or slabs, of Z-shaped cross-section. The sections are hung one on another from the top downward, the top section being suspended in a strong crows-ring let into the standing rock at the top of the shaft. Several successive rings of the lining having been placed in position, the annular space between the lining and the surrounding rock is sealed at the bottom and the inclosed space filled with a cement mortar of suitable strength and consistency injected through holes provided in the slabs for that purpose. This mortar when hardened binds the lining firmly to the rock, which then carries practically all of the weight of the lining and no danger exists of breaking one section by the weight of the lower ones. The mortar also serves to effectively seal joints and make the lining watertight.

This method dispenses with all formwork in the shaft and permits shaft sinking and shaft lining to be carried on simultaneously, without appreciably interfering with each other, the slabs having, of course, been made in sufficient quantity in advance to permit of rapid and continuous work. A nondestructible homogeneous fire- and waterproof lining is thus produced, giving uninterrupted service without maintenance expense throughout the life of the mine.

The best way to line drifts and passageways is by a monolithic reinforced-concrete lining. The forms should be of standard-section collapsible type of wood or steel, which may be erected, taken down and moved ahead as the work progresses. This type of form,



CONCRETE-LINED SHAFT AT THE PLANT OF THE BUNSEN COAL CO., CLINTON, IND.

which is the most economical of form material, insures the greatest speed in erection and removal, insures uniform passageway area and may be reused a great number of times without renewal.

The concrete may be mixed on the surface, brought in in buckets, and moved on cars to the form to be filled, or it may be mixed within the mine convenient to the work. In the latter case care must be exercised in regard to the materials used. Slate, bone, coal or other unsound materials should not be used as aggregate, but only clean sand and pebbles, or sound rock broken to suitable size. Mine water should not be used for mixing the concrete as it generally contains chemicals that might be injurious.

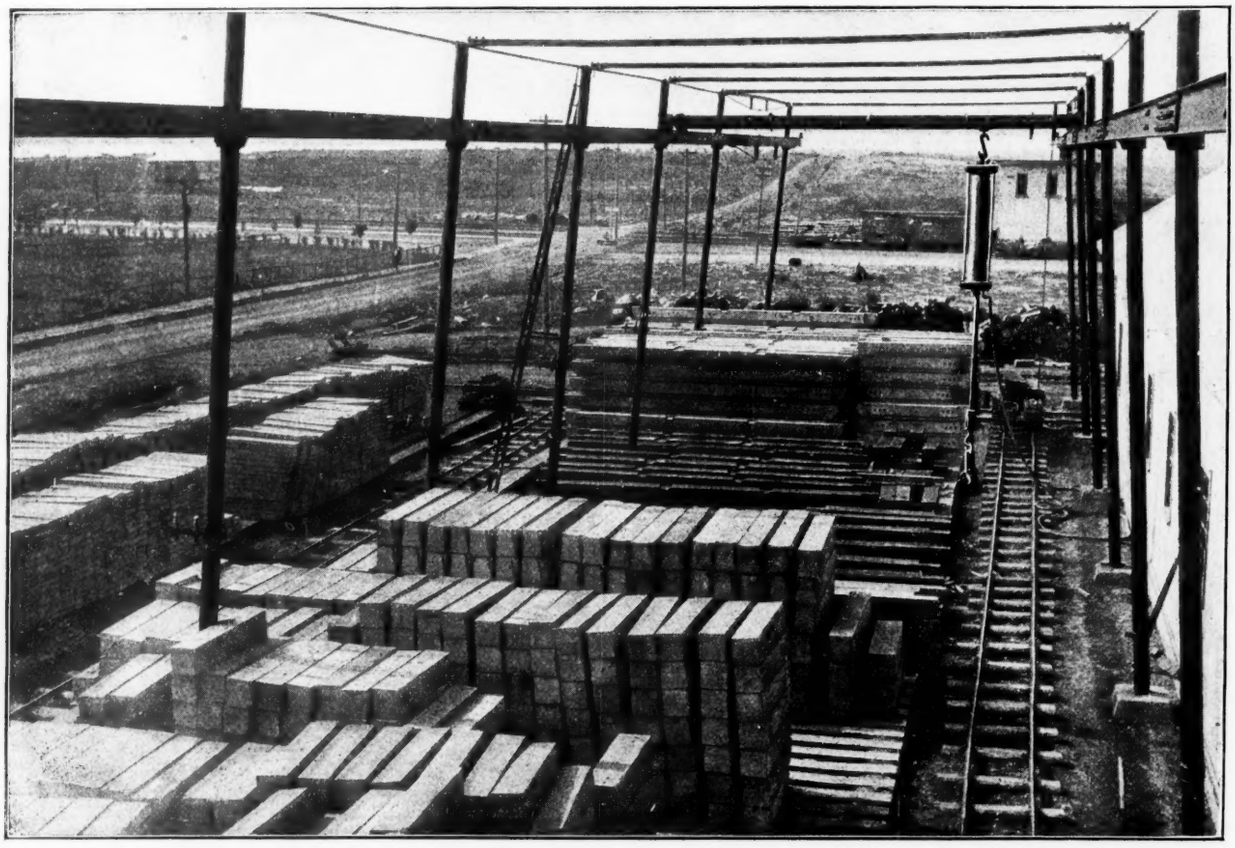
The passageway thus lined has the great advantage of being fire- and waterproof. It is also free from the annoyance due to the suspension of all traffic at frequent intervals by reason of rocks falling on the track from the roof, and once the lining is in place it will require no further thought or worry, nor will it necessitate any expense for maintenance.

Concrete Props and Timbers

The passageway should be concrete-lined as soon as possible after being opened. If this is done a much thinner lining will be required than will be the case when disintegration of the rock has set in.

A serious difficulty in mine operation is the necessity for the frequent renewal of wooden timbers and props. In some cases such renewals are imperative every six months and occasionally at much more frequent intervals. This is an expense which adds greatly to the cost of operation and maintenance. This difficulty is solved and the attendant expense eliminated by the substitution of concrete "timbers."

These are pre-molded on the surface and are usually 8 x 8 in. in size and of various lengths to suit local conditions. The edges should be slightly beveled to prevent chipping in handling, and after having been molded the "timbers" should be permitted to season for two or three weeks or longer, during which time they should be wet daily. When so made they can be used and reused indefinitely, left in one place as long as may be required, and no expense is attached to the timbering of the mine other than the cost of material and labor of placing the timbers, and moving them from place to place as may be required.

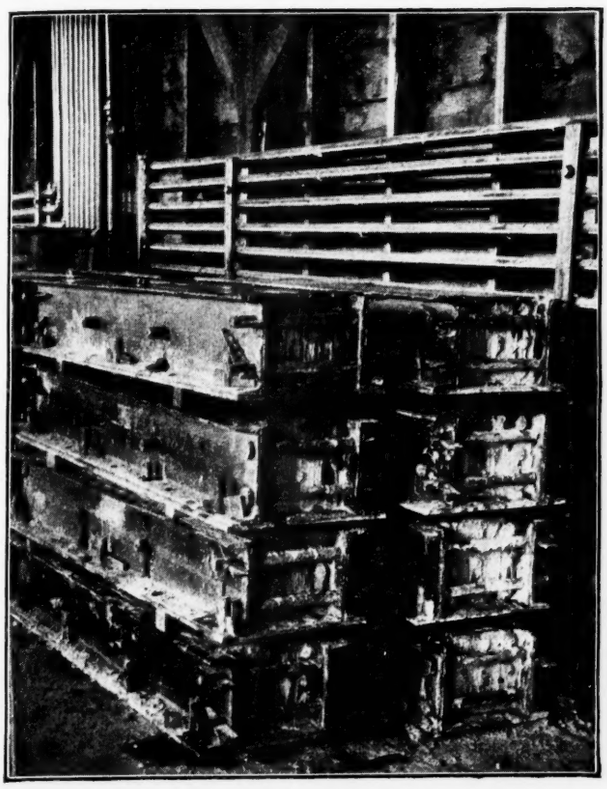


CONCRETE MINE TIMBERS IN PROCESS OF CURING AT THE OLIVER MINING CO., HIBBING, MINN.

Bulkheads and Stoppings of Concrete

Bulkheads and stoppings may be constructed of either monolithic concrete cast in place or of pre-molded concrete blocks set in cement mortar. The former method is preferable as it insures an absolutely tight contact with the surrounding rock and a perfectly gas-tight wall throughout. But in either case it will be absolutely fireproof and an effective fire and gas barrier. If of the monolithic type, the same comments on the methods of construction that were made earlier in the article as to gallery linings, will apply.

Shops, stables, hayrooms, powder magazines and similar structures may be built of monolithic concrete cast in place or of pre-molded concrete blocks set in



STEEL MOLDS CONTAINING MINE TIMBERS UNDERGOING PRELIMINARY HARDENING

cement mortar. Either method will result in a permanent fire- and waterproof structure.

Track ties should be of pre-molded concrete of suitable length and cross-section and thoroughly seasoned before being used.

Water-bearing rock crevices in unlined drifts, shafts or rooms may be effectively plugged by shooting cement mortar into them with the cement gun. Existing mine structures may also be made fire-resisting by the same method, by a cement mortar coat applied on an expanded metal or wire inclosure.

Consumers Urged To Reduce Coal Requirements

The urgent demand for coal from all sources has prompted the committee of the Chamber of Commerce of the United States coöperating with the Council of National Defense to send forth a special war bulletin requesting every user of coal to endeavor to reduce his requirements, in the belief that if an effort were made in this direction there would be a vast saving.

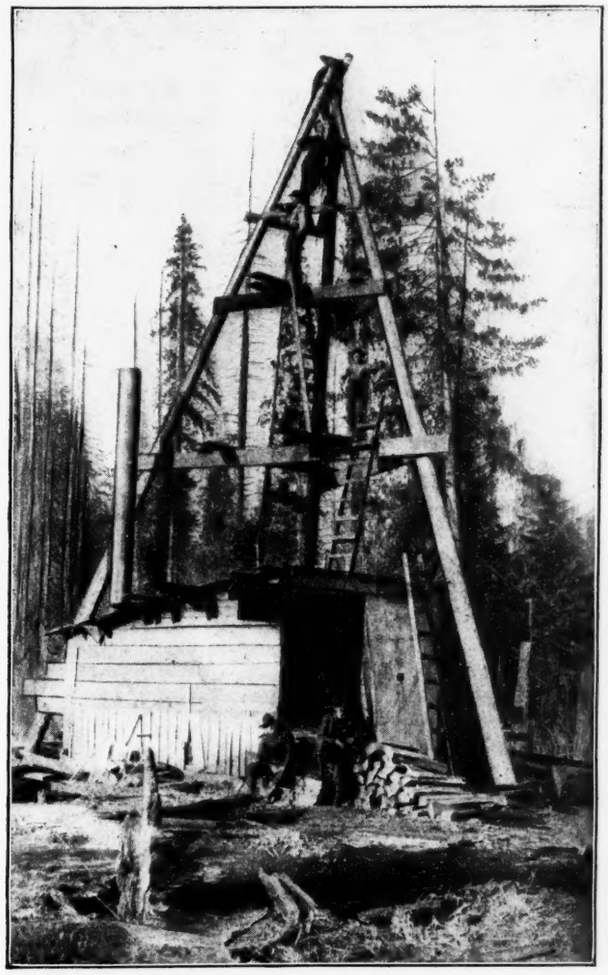
To this end the committee suggest to the coal consumer that he do the following: (1) Inquire into the methods employed by his firemen and consider these methods in relation to those suggested by the Bureau of Mines. (2) Learn what plants in his locality secure the best results from coal. (3) Endeavor to have the wasteful users of coal profit by the best experience of the locality. (4) Improve all local methods by consultation with the Bureau of Mines and study of the stoking methods recommended by the Bureau. (5) Buy coal as near home as possible.

Coal Economies

Since the war began, the use to which European countries put coal byproducts has aroused chemical manufacturers to the possibilities in the almost virgin fields of this continent.

The University of Illinois has made extensive experiments in the reduction of iron pyrite from coal. Pure iron pyrite contains 46.6 per cent. of iron and 53.4 per cent. of sulphur, and is known chemically as ferrous sulphide. In many coal mines there is a big quantity of coal rejected for impurities which have practically no fuel qualities. These impurities are variously known as "sulphur balls," "cat faces," "kidney sulphur" or "brasses." When burned, this coal gives a high percentage of sulphur dioxide gas, which in contact with water corrodes boiler flues and stacks.

The mineral pyrite occurs frequently in Illinois coal. This coal when properly treated can be freed from the sulphur pyrite and after screening is salable. The pyrite is then used as the base for making sulphuric acid. Before the war, the bulk of pyrite was imported from Spain. The Spanish supply has been largely cut off, and under the present market conditions a clean pyrite product is worth from three to four times as much a ton as the coal with which it occurs.



DIAMOND DRILL AT THE CANADIAN COLLIERIES, CUMBERLAND, B. C.

Strip-Pit Mining of Bituminous Coal*—II

By H. H. STOEK
Dean of Mining, University of Illinois, Urbana, Ill.

LOOKING into the history of steam-shovel mining, it was found that Grant Holmes, of Danville, Ill., for many years closely associated with the manufacture of steam shovels and with the development of the Mission Field Mining Co. near Danville, had gathered a large amount of data upon the development of the steam shovel in connection with coal mining. The incorporation of these data in this paper he has most kindly permitted. For practically all of the following historical section, credit is due to Mr. Holmes.

In 1866, Messrs. Kirkland, Blankeney and Graves opened a strip mine at Grape Creek south of Danville, Ill. In 1875, the late Michael Kelly opened a similar mine at Hungry Hollow, also near Danville, and a number of like operations were begun at about the same time in this same district.

The coal was usually exposed in long pits, a section along one edge of the field being first plowed, the surface removed with scrapers, and the overburden piled in a long mound overlooking the pit. This work was usually done in the summer, and the coal was mined and hauled out by wagons during the winter. The following summer a block parallel to the one previously mined out was stripped, the waste being dumped into the abandoned cut.

In 1876 and 1877, J. N. Hodges and A. J. Armil began stripping near Pittsburg, Kan., depending upon the experience of Mr. Hodges in using steam shovels for building railroads in Ohio. After stripping coal with teams and scrapers for a while, they decided that a steam shovel would do the work better. In 1877 they rented an Otis steam shovel, and this is the first record of steam-shovel coal stripping. In regard to this pioneer machine, Mr. Hodges says:

> We operated the shovel for about one year with success, when I sold my interests to engage in other business, but the shovel was operated very successfully for about three years, when it was returned to the owners. Our coal was covered with from 8 to 12 ft. of overburden. With good management this could be handled very well, but the quantity of coal at this depth was limited and the boom of the shovel was too short to do deeper work and to waste the

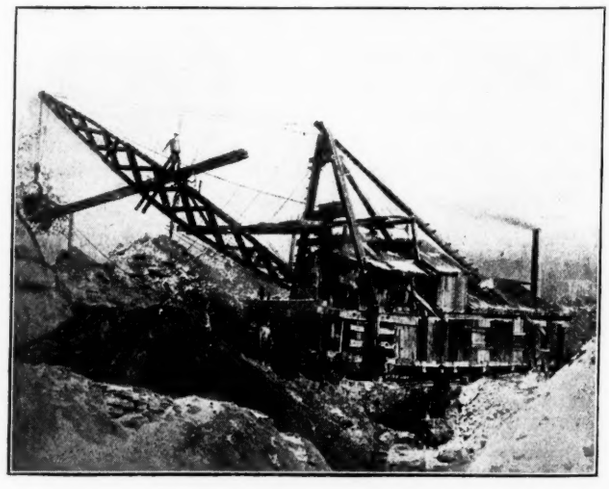


FIG. 1. WRIGHT & WALLACE'S SHOVEL WAS A DREDGE MOUNTED ON WHEELS

*Second installment of a paper to be read at the October meeting of the American Institute of Mining Engineers, to be held at St. Louis, Mo., and other Middle West points.

overburden far enough away so that a pit of coal of sufficient width to handle economically could be uncovered.

Mr. Hodges expressed the opinion that a larger shovel could be successfully used for such work, but the manufacturers said that such a shovel was not practicable.

The second firm to get steam-shovel experience was the Consolidated Coal Co., of St. Louis, which owned a stripping proposition in the river bottom, known as Mission field, near Danville, Ill. The overburden did not exceed 35 ft. and was often only 10 to 15 ft. deep, while the coal bed was 6 ft. thick. Wright & Wallace, of Lafayette, Ind., dredge contractors, accepted the contract to uncover a fixed amount of coal daily for the Consolidated Coal Co., under the supervision of J. L. Swansberg and Louis Stockett, of the Consolidated Coal Company.

They accepted the opinion of Hodges and Armil, that steam shovels had not been developed to a size suitable for stripping coal economically and, being dredgemen, Wright & Wallace purchased from the Marion Steam Shovel Co., of Marion, Ohio, a dredge minus the hull, which they erected on a wooden frame (Fig. 1), supported on wheels, thus forming a dry-land dredge built entirely of wood. The boom was 50 ft. long and a single-cylinder vertical steam engine furnished power to hoist the ¾-yd. dipper and to swing the boom. With this machine 400 cu.yd. of overburden per day was a great record.

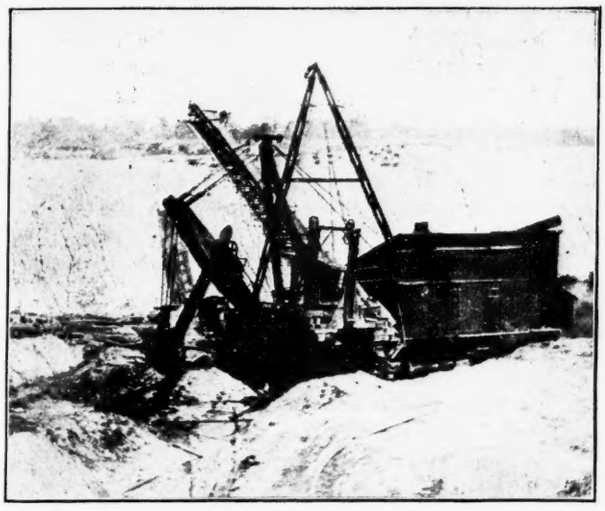


FIG. 2. DREDGE DIGGING OVERBURDEN AND STACKER PILING IT ON A LONG SPOIL BANK

The only means of propelling the dredge was by block and tackle; hence the moving of the outfit was a slow process, particularly on curves, as the wheels were rigidly fastened to the frame. This dredge moved forward in an elliptical spiral path and, as the curves became short, jacks were used to skid the dredge around the sharp curves. The widest cuts possible with the dredge were 20 ft., and on account of the limited dumping range waste banks could not be placed far enough away to prevent the dirt from rolling down and covering up the face of the coal. Because of this gradual covering of the coal, it was necessary for the coal miners to follow immediately after the stripper and also to cut an entry in the coal before it could be loaded.

The slowness of operation, the narrowness of the cut, and the annual flooding of the field from the neighboring stream induced the contractors to place a second shovel in an effort to keep their agreement with the Consolidated Coal Co. This second dredge or shovel was similar to the original one, but larger, having a 1½-yd. dipper. Soon after, a third similar machine was purchased with a 1½-yd. dipper, 65-ft. boom, and two vertical steam engines.

FIG. 3. A STACKER AT WORK DELIVERING SPOIL OVER THE TOP OF A HIGH BANK

In 1888, an unforeseen complication arose in the nature of a strike of the coal miners, which shut down the coal-producing part of the operation. As this contingency had not been provided for in the contract, the stripping contractors continued to operate the dredges or shovels during the strike, and a point was soon reached where the shovels had made a complete round of the workings and were starting on a second cut, depositing the overburden upon the coal which had been stripped on the preceding round.

Shovels Too Small and Clumsy for Profit

To overcome this, the coal company bought the dredges and the contract, and when the strike was finally settled the stripping work was resumed and the three machines operated for two years by the Consolidated Coal Co. Apparently no money was made in the operation of the strippings, so in 1890 they were abandoned. The heavy expense entailed in their operation, the slow rate at which the coal was obtained and the fact that the machines were about worn out made a continuation of stripping along the same lines undesirable. The machines were not constructed for such heavy work and they could not be kept in operating condition, though the company made many fruitless attempts to keep them in repair.

The next development in steam-shovel mining was an adaptation of a scraper line used in the production of clay for ballast burning in Kansas and Missouri. This gumbo or sticky clay was burned in trenches in which alternating layers of coal and clay were placed. In the digging of the trenches the Butler brothers (Henry G. and William), who were the ballast burners for the Rock Island R.R. and who previously came from Kenosha, Wis., used draglines and a cable-manipulated scraper bucket.

The Consolidated Coal Co., after investigating this dragline operation, made a contract with Butler Brothers to finish the stripping at Mission field. They began

FIG. 4. LOADING STRIPPED COAL INTO CARS

work in 1890 with three draglines having bucket capacities of ¾, ⅞ and 1 yd. respectively. The drag or scraper buckets were steel boxes with one open end and with teeth on the bottom edge. A cable passing through a sheave wheel on the top of the drag served as an adjustable trolley on which the buckets moved forward and backward and by means of which the boom was raised and lowered.

By means of ropes fastened to the two ends the buckets were moved backward and forward, and by means of another cable the latch was tripped so that the bucket swung downward to dump the load. These various cables were strung along a horizontal boom 80 ft. long, which boom was suspended from a vertical frame or gantry by ropes. Two vertical boilers supplied power for a two-cylinder engine geared to three drums which were controlled by clutches. The machine was self-propelled in either direction by means of gearing operated from the same engine.

These draglines worked on top of the bank and near the edge with the horizontal boom extended over the cut. The machines worked with accuracy and speed and three dumps per minute was not an unusual record. As the boom could not swing, the whole machine was moved to keep the scraper supplied with digging material, and to prevent the dragline from sinking into the soft material composing the overburden much track-laying of an expensive nature was required.

DRAGLINES DID WELL IN LIGHT EASY STRIPPING

With these draglines, a rectangular cut was made about 20 ft. wide and ½ mile long, the boom being of sufficient length to permit the waste bank to be built far enough from the coal face to prevent burying the face by sliding spoil. When the end of the cut was reached, the machine was moved back about 20 ft. from the edge of the bank and then was worked back in the reverse direction from the previous cut, the spoil being deposited in the cut from which the coal had meanwhile been quarried.

These machines first operated on what is known as the upper bottom of Mission field, where the work of Wright & Wallace had also been done. The stripping was shallow and the overburden contained no hard material, so that the operation was carried on with ease and speed, and an output of 1000 tons of coal a day was obtained. The easy stripping ground available in this section did not last long, as much of the coal had been mined by Wright & Wallace in their previous work. So because of increased overburden, unexpected appearance of hard blue shale above the coal, and bad floods, the Butler Brothers[1] moved two of the excavators to what is known as the lower Mission field, the third machine being abandoned.

In this new field the overburden was light, and rapid work was made on a 40-acre tract of coal. The machines operated in tandem, one stripping, and the other, loading the coal directly into railroad cars which ran into the pit, making one of the first examples of machine coal mining. In the center of the field, however, shale and sandstone were encountered and the depth of overburden increased. In consequence the work progressed more slowly and it became necessary to drill and blast the hard material, thus increasing the cost of production. Butler Brothers' contract with the coal company was for a certain price per ton delivered on coal cars and, as the result of the difficulties in digging and the trouble with the miners, who struck for an eight-hour day and increased wages, the draglines were abandoned.

EVEN LARGER DRAGLINE EXCAVATOR INSTALLED

Butler Brothers still believed in this type of excavator and thought that a larger one would be successful. Financed by the Consolidated Coal Co., they began the erection of a large dragline which should handle deep stripping shale, soapstone and coal, and in 1900 this large machine was completed at a cost of $30,000. It was supported on three 10-in. axles, each 22 ft. long, the center axle being geared to the engine and the end axles connected to the center one by driving rods. The horizontal boom was 135 ft. long and was supported by a vertical gantry 60 ft. high.

To balance this, the rear end of the machine was loaded with 25 tons of iron, but later, as the result of a fire, the horizontal boom was shortened by 20 ft. and then the difficulty was to keep the machine from tipping backward. Three buckets were used, each holding about 2 cu.yd., one intended for dirt, one for rock and the third for coal. The difficulty in operating this machine was its immense weight, which caused both rails and ties to be buried in the ground, especially those near the edge of the bank, with the resultant constant fear that the whole machine would slide into the pit.

[1]H. H. Stoek: "Dredging for Coal." "Mines and Minerals" (August, 1901), 5.

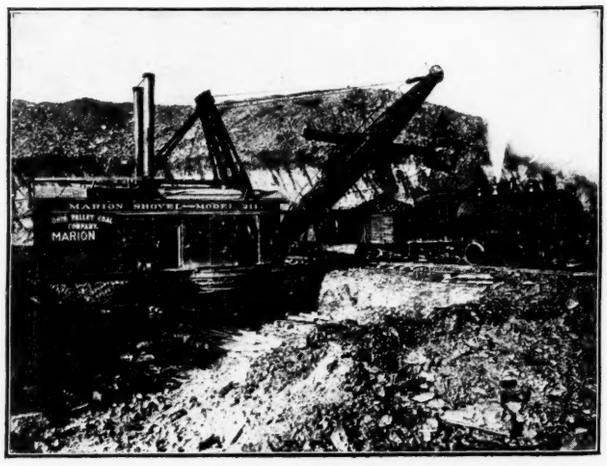


FIG. 5. COALING FREIGHT ENGINE WITH SHOVEL

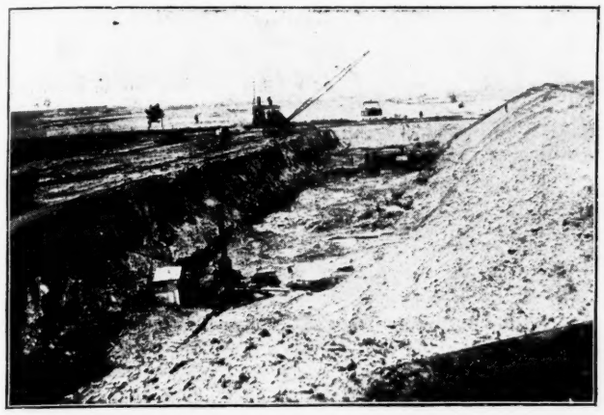


FIG. 6. WHEN COAL IS DUG IT MAY BE LIFTED FROM STRIP PIT IN BOXES OR SKIPS

The rock bucket, which was later fitted with a knife to cut into the hard material, was not successful, as it could not be held in the cut, and drilling and blasting, at a heavy expense, were necessary. The loading of the coal with the machine was entirely successful and 25 gondola cars could be filled in a day.

After two years of unsuccessful effort to keep to their part of the contract, Butler Brothers gave up the undertaking, but 16 of their employees leased the equipment and, as a coöperative venture, under the name of the Salt Fork Co., operated with fair success in a section where the coal was not covered with hard material. In 1904 this enterprise failed, due partly to there being too many coöperators.

In 1903, Mr. Donovan and associates, with a Schenable dragline, operated in the Middle Fork bottom of Mission field in a neighboring valley to the one the Salt Fork Co. was operating. This dragline, though much smaller than those of the Butler Brothers, revolved in a complete circle, and for nine months this machine operated; but, due to overflow from the adjoining river, the waste banks slid down so badly that no coal could be taken out. The outfit and property were bought by Edward Gray, who organized the Gray Coal Co., but after five months of unsuccessful operation he also gave up.

River Again Invaded the Strip-Pit Workings

Mr. Gray was next made manager of the Salt Fork Coöperative Co., but in less than a year's time the cooperators again took the proposition into their own hands and for two years attempted to carry on the work. The occurrence of the hard soapstone, excessive repair bills and floods from the near-by river, resulted in the failure of this enterprise for the third time. Thus, after a period of nine years and as a result of the efforts listed, only 7 or 8 acres had been stripped, at a cost of approximately $100,000.

In 1907, under conditions similar to those in the Mission field, a stripping was started in the Robinson Creek bottom near Lilly, Ky., where the Jellico coal bed was 28 in. thick with only 6 to 8 ft. of overburden. Two shovels, built by the Vulcan Steam Shovel Co., of Toledo, Ohio, were used, one for stripping, the other for mining. The stripping shovel had a 2½-yd. dipper and a 28-ft. boom mounted on railroad trucks.

The mining shovel, known as the Vulcan "Little Giant," had a 1¼-yd. dipper, a 22-ft. boom and was mounted on traction wheels. After two years' trial the work was discontinued, the principal trouble being that water caused the waste banks to slide into the pit. The Standard Block Coal Co. tried to operate a Monigham dragline in this district, but unsuccessfully, and after one years' work the attempt was given up.

Thus, in both the Mission field and Robinson Creek bottom, first steam shovels were used and then draglines. A combination of these two types was tried by the Danville Brick Co., of Danville, Ill., in a tract adjacent to its brickyards, which contained about 4 acres of coal under 25 ft. of cover. A small Vulcan steam shovel worked on top of the coal and dumped the spoil on one side.

Moving parallel with the shovel, a small dragline mounted on top of the nearest waste bank picked up the spoil from the shovel and deposited it in front of the dragline, thus laying the foundation for its own tracks and also building the waste bank. As this coal was intended for use in the brick plant of the operating company, the question of reasonable profit did not enter in so long as the coal could be produced below the current market prices. This piece of coal was uncovered during the fall and winter of 1912-1913.

Used Short-Armed Shovel and Belt Conveyor

About six miles southeast of the Mission field is a stripping area called the Carbon Hill district, containing about 70 acres underlaid by No. 7 coal 6 ft. thick, with an overburden of about 40 ft. of sand, gravel, loam and a heavy bed of shale. This tract was purchased by the Consumers Coal Co., of Danville, in 1904, who contracted with George W. Prutsman, an excavation contractor, to strip the area. The machine used was built by the Bellefontaine Foundry and Machine Co., of Bellefontaine, Ohio, according to the joint ideas of Mr. Prutsman and George E. Turner, who were familiar with the failures of the dragline.

They adopted the steam shovel, but instead of using a long-boom shovel, as Wright & Wallace had done, they incorporated a belt conveyor to handle the spoil dug with a short-boom shovel. This shovel could dig rapidly and deposit the waste in a hopper (Fig. 2) that fed the conveyor belt (Fig. 3), which traveled at right angles

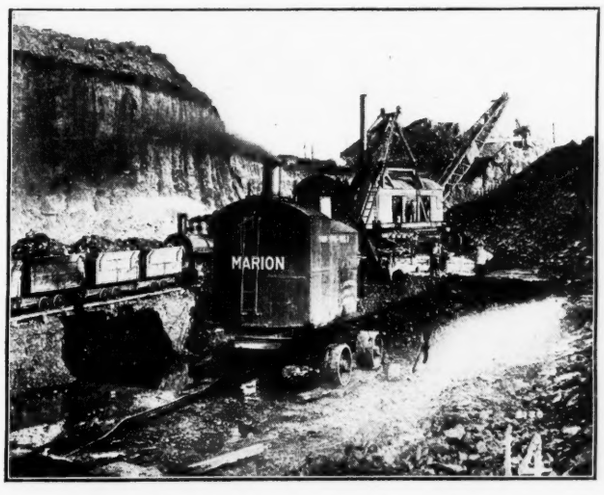


FIG. 7. A COAL SHOVEL IN THE FOREGROUND AND A STRIPPING SHOVEL IN THE REAR

to the direction of digging. The shovel was operated by four two-cylinder engines, one for hoisting the 2-yd. dipper, a second for crowding it, a third for swinging a 35-ft. boom, and the fourth for operating the conveyor, which was 105 ft. long.

The machine was built of wood and was mounted on four four-wheel trucks, thus giving a four-point suspension, no attempt being made to keep the frame level. It was propelled by block and tackle. The machine could only dig forward, hence the circular plan of operation was used. The work was begun in 1904, the surface being stripped in the summer and the coal loaded out during the winter.

After several attempts to get the field in shape for circular operation, the plan was abandoned on account of the irregular shape of the coal area and because of the great depth of overburden found in certain places. To overcome this the work was opened in parallel cuts, which necessitated leaving the coal in the cut after one cut of the spoil had been completed, until the excavator could be moved back to the starting point for a second cut. This moving back usually took two weeks, and the

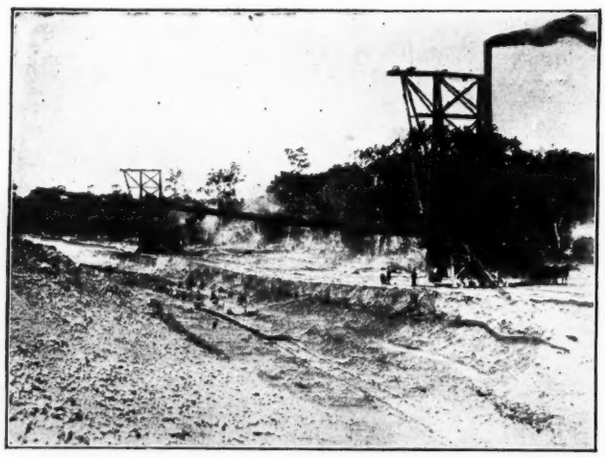


FIG. 8. BUTLER BROS'. DRAGLINE REMOVING OVERBURDEN FROM THE COAL

parallel cuts were not straight but had many inside turns in them—that is, turns in which the dumping arc is smaller than the digging arc.

The end of the conveyor boom was thus practically a center about which the machine traveled during these turns and consequently the waste bank would build up so as to clog the conveyor. The conveyor was lengthened to 147 ft., but this did not obviate the difficulty; the bills for repairs were heavy, especially for the conveyor belts, and after two years Mr. Prutsman gave up the contract.

Backed by other men who form the Coal Production Co., he took a new contract which in a few months also stopped for lack of funds. The Consumers Coal Co. then decided to operate the stripping itself and the shovel was completely rebuilt, steel being substituted for wood. However, in spite of a better shovel and careful management, in 1913 this company quit business without having made a profit. This type of machine was therefore abandoned as a theoretical success but as a practical failure.

The combination of shovel for digging and conveyor for depositing of the spoil seems to be a good one. Morton E. Pugh, who spent a fortune and lifetime with conveying-belt strippers, took out his first patents on a machine that moved and dug sideways, the conveyor dumping behind.

His later patents show that he separated the excavator and the conveyor into two independent machines, the steam shovel being substituted for his excavator and a crusher being added to the conveyor for sizing the waste before dropping it on the belt, the two machines being operated on parallel tracks. Mr. Pugh also planned to use a revolving steam shovel, so that the conveyor could be on the same track behind the shovel, but several attempts at such operation made in Iowa were unsuccessful.

The Carbon Hill stripping area is now being operated by the Carbon Hill Coal Co., with a revolving 5-yd. dipper shovel.

In 1909, the Missionfield Coal Co., of which W. G. Hartshorn was president, leased the stripping equipment above described as belonging to the Consolidated Coal Co., and after two months' trial operation bought both the property and the equipment. Easy stripping and the absence of floods and labor trouble permitted a good profit to be made with the dragline for about 16 months, but then repairs became excessive and the equipment was abandoned.

Those connected with the Missionfield Coal Co., although recognizing the faults in the Prutsman machine, believed that the ultimate stripping machine must combine the dumping range and the digging power of the conveyor steam shovel with an ability to dig and dump in any direction; that is, it should be a revolving shovel.

Came, at Length, to Large Revolving Shovels

They believed that the appliances built along these lines had failed because they were too small to stand up to the work, and that the new type of stripping machine must be of greatly increased size; but although several of the steam-shovel manufacturers were already making small revolving shovels and locomotive cranes, none seemed willing to undertake the construction of a large revolving shovel.

In 1910, the Vulcan company built two revolving shovels for stripping purposes with 1½ yd. dippers and with booms about 50 ft. long. Patrick Dirky and Joseph Stevenson each purchased one of these machines for use near Pittsburg, Kan. The shovels were badly proportioned in the swinging parts and constant breakdowns resulted. While these original shovels have been operated by a number of different men since that time, and are still being operated, they have never been very successful.

The Brown Co., of Cleveland, Ohio, next modified a locomotive crane so as to form a revolving steam shovel with a 2-yd. dipper and a 50-ft. boom, and in 1910 this machine was put to work in the Mission field. In six months the remains were sent back to the factory, as the machine was too lightly constructed, but it was evident that a start had been made in the right direction; and after two years of argument, the Marion Steam Shovel Co. began the construction of a revolving shovel, the dimensions and general design being suggested by Grant Holmes and W. G. Hartshorn, of Danville, Illinois.

The machine had a 3½-yd. dipper, 40-ft. handle, 65-ft. boom, and weighed 150 tons. It was the largest shovel

in the world up to that time. A unique feature was the hydraulic compensating truck, which was patented by Mr. Holmes, and which is now used on all shovels of the Marion type. By means of this device the shovel frame is kept level when the apparatus is moved over irregular tracks.

In 1911, this big shovel, known as Model 250, began work in the Mission field, where it continued until the field was stripped completely, toward the latter part of the fall of 1915, thus completing the work of stripping the field where the early experiments of the Butlers and Brownings had been carried on. After four years of successful and profitable operation, the shovel was in good condition and repairs had been very slight.

From the Mission field it was moved to an adjoining stripping basin owned by the same interests, where it is still in operation. The operation of this shovel was watched with interest and, as soon as it was a demonstrated success, others were built. The large-size revolving shovel has now become the feature in coal-stripping operations. Draglines are used in a few places and their general construction is similar to that of the steam shovel in so far as the operating devices are concerned.

The illustration at the head of the article shows a Bucyrus No. 175-B shovel with 75-ft. boom and 3½-yd. dipper stripping coal at Chicopee, Kansas.

(*To be continued*)

Old and New in Coal Breakers

THE most noticeable change that has taken place in the development of the coal industry in the Panther Creek Valley in the last 20 years is the advancement in the method of preparation and the complete revolution of the breaker system. Instead of the small, ill-kept buildings of that time, there are now erected large imposing structures, the shipments from any one of the larger of these surpassing the entire output of the valley at an earlier period.

The surroundings, too, have undergone a decided change. The piles of rubbish, dirty and offensive to the eye, have all disappeared. In their stead are clean and tidy yards. Flowers are in bloom during the summer. The buildings are freshly painted and the masonry newly whitewashed, all of which adds to the beauty of the surroundings and speaks well for the pride taken by the men in the appearance of the collieries.

The greatest change, however, took place in the working conditions in and around the breakers. In the old breakers, except in the screen building at Hauto, water was almost unknown. Nos. 5 and 10 had water, but only to a small degree, as compared to its present use. One side of the breaker was always dusty. It depended on the direction in which the wind blew. During the summer the dust on both sides was so thick at times that it was impossible to see the mouth of the screen from the end of the table, where the boys were picking the slate. Dust was everywhere. On the cross-beams, where it was not disturbed, it accumulated a foot deep in places. To work in these buildings in the winter time was a severe hardship, as there were large cracks through which the wind and snow blew.

The coal was taken from the mines to the breaker and dumped. Everything but the lump coal went into a large screen known as the "mud screen." Here the smaller sizes dropped through the meshes, later to be carried by the elevators and distributed through the breaker, after it had passed the rollers and had been crushed to various sizes. The coal coming out of the end of the mud screen was picked on a table called the "mud chute." This place was reserved for old men.

Occasionally a boy was started there to learn how to pick slate, and when proficient he was promoted to egg coal, which was the real hard work. From egg coal he was put to picking broken coal, and from there was promoted to what were designated the "snaps." This meant that he was watching one of the various chutes or hoppers to see that it didn't block. These places and the different slate chutes were filled by the older fellows, as the rule of seniority prevailed.

The only coal directly prepared for market was lump, broken and egg. All the finer grades were taken to Hauto and prepared in the screen building. At that time a vast amount of marketable coal was dumped as refuse, a fact that accounts for the profitable rehandling of the culm banks today.

As the unprepared coal that came from the entire valley was rehandled at Hauto, the hours worked there were longer than the regular 9 hours. It was nothing unusual to work 12, 14 and 16 hours a day. Though the hours were longer, the working conditions were better. Here there was an abundance of water and an absence of dust. Jigs were used extensively for eliminating the slate and the picking done by the boys was not so tedious. Long hours was the only drawback.

The boys as a whole were much younger then than the average breaker boy today. Twelve years of age was the required limit before they were permitted to work, though many were 10 and 11, and a few quite younger. When these boys started to work their educational advantages practically ceased. True, the boroughs provided night schools for several months each year, but after the first week these were poorly attended.

Today the conditions are vastly different. Each breaker is thoroughly equipped, shipping the coal directly to market, and all sizes are now used. Dust is almost entirely eliminated, except at the dumps. The floors are clean and steam heat keeps them warm during the cold weather. Boys are not permitted to work in or around the breaker unless 16 years of age, and they then must furnish proof from the school authorities that they have finished their primary education. The company has provided a night school, where the boys are taught the common branches, as well as those that will fit them for promotion in their chosen line of work. Foreigners are also taught the fundamentals of American rights and citizenship.

With these transformations has come a decided change in the personnel of the colliery officials. During the old régime the foremen were men grown up in the service and imbued with old ideas. Today they are replaced by young men, energetic men who have studied the business and are playing an important part in the development of the basic American industry.

National Safety Council Meet—II

By R. DAWSON HALL

ONE of the most interesting papers in the first session was contributed by H. I. Young and Dr. A. J. Lanza. Its references to the value of good ventilation in metal mines were specifically supported later in the paper by George S. Rice. Both papers may be regarded partly as tributes to the services rendered by the coal industry to the metal-mining fraternity. From the coal mines the metal miners have learned the wonderful possibilities existing in good ventilation, though their purpose in establishing it is somewhat different to that which animated the coal operator in securing a plentitude of air.

In the coal mine the fan came in primarily as a means of purging the mines of firedamp. Later its use was extended for the purpose of removing smoke.

Perhaps neither reason really had equal cogency in metal mines, because they do not generate explosive gas and because only in tunnels was the air as badly befouled as the air of coal mines. The cost of driving rock tunnels was so high that duplicate airways, with crosscuts, much as they were needed, often could not be driven if any profit on the investment was desired.

Large fans, such as in earlier years were the only ventilators to be found in coal mines, could do little for the tunnels in metal mines. In the stopes the shooting was not so frequent nor were the men who shot so numerous as in coal mines. The need for ventilation was therefore not so pressing.

But the metal miners have needed air to cool down the mine to a workable temperature and to make high temperatures endurable. Good air means energy everywhere in a coal mine or in a metal mine. A breath of fresh air is a tonic of vigor.

Young and Lanza stated that in the Butte district a tunnel, which was being driven for $15 a foot, was furnished with a fan and a canvas conduit, and as a result the cost of driving fell to $8 a foot. This place was 2000 ft. below the surface and both hot and moist. The conditions, while symbolic of those in coal mines, are precisely similar to but few of them.

Another fact of like kind might be found of interest and more suggestive to coal men. A shaft was sunk 50 ft. in one month and 60 ft. in another. A small blower with a canvas pipe was then installed, and in the next month 120 ft. of progress was made. "No better evidence could be given of the deleterious effect of poor ventilation on working ability," says Mr. Young.

THE discussion tended to drift continually to efficiency and mine management. Some contended that the ventilation of a shaft during sinking should be by exhaust, and others declared that a shaft could be sunk with either an exhaust or a pressure fan.

M. H. Sigafoos, of the Hazard Manufacturing Co., replaced O. P. Hood, of the Bureau of Mines, on the program in the assignment, "Hoisting Ropes." As his paper will be published in an early issue of *Coal Age*, it will be unnecessary to refer to it in detail here.

In discussing the paper of A. J. Moorshead, president of the Madison Coal Corporation, relative to mine-rescue work, J. T. Ryan said that one company had decided to give the apparatus men at its mines real mine experience rather than training in an outside smokeroom. The men established their training quarters in a crosscut which was blocked off at each end by doors. In the crosscut actual experience was obtained in timbering and even coal cutting, under conditions precisely similar to those obtaining when a coal mine disaster occurs.

In this way there was a minimum of "make-believe" necessary, and the men had a clear realization of what mine rescue meant with all the drawbacks of darkness and with natural roof and floor conditions. The actual digging of coal had, of course, a bad effect on the mine and made necessary a change in venue after two years, for the crosscut in that length of time attested only too clearly the strenuous character of the operations.

THE comparative value of life lines and telephone lines in rescue work was discussed. Of course, no reference was made or intended to the permanent telephone lines or even to temporary lines meant for the use of men not in breathing apparatus, the value of which is not open to question. J. W. Paul declared his preference for the life line. It is true that the helmet telephone had been used by one man successfully. He employed it when descending a shaft and with its aid he was able to report where the cage struck and why, and also what was the condition at different depths.

Mr. Paul said that the helmet telephone was unsafe, the connecting wires permitted asphyxiating gases to enter the helmet. In fact the helmet itself is somewhat generally disapproved. However, E. H. Price, of the Philadelphia & Reading Coal and Iron Co., who has had much experience with breathing-apparatus helmets, declared that they were safe and desirable. J. T. Ryan stated that Mr. Groves, of the Tennessee Coal, Iron and Railroad Co., had introduced a new telephone arrangement that could be used with the mouth-breathing apparatus.

In reply to a question J. W. Paul said that the Bureau of Mines was using the oxygen inhalator with manual methods for resuscitation work. D. J. Parker's paper on the Bureau's mine-rescue car called attention to the improved steel cars now being put in the service. No longer is the bureau satisfied to regard the cars as a means of promoting safety, important as that is.

It is safe prophesy that the cars will shortly be made everywhere a sort of traveling school of instruction from which mining methods, first aid and sanitation will be taught. They will be vocational training schools, teaching safety, health and good mining methods. The movement is still in its infancy. Three cars only are so equipped. These have in addition to the crews of the original cars a mine engineer, a surgeon and a clerk. Not a large staff, but quite suggestive of the time when every car will have not only these but an interpreter or two and perhaps a social worker or so, and among them will be, not only men, but two or three women for welfare work among the miners' wives.

The government of this country should not be planned for the advantage of men only or for the sole good of the industrial workers. Their wives have equal need of our care and an equal right to an appropriation for their betterment.

Hans Carl Behr, in his discussion of M. H. Sigafoos' paper, said that the factor of safety should be set at 6 and not at 5 when based on the load imposed on the rope by the hoisting of men. He said that the modulus of elasticity of rope was too often taken at 28,000,000 lb., the modulus of a bar. Mr. Behr declared that at first it was only three-eighths as much as that, though it might rise later to as much as three-fourths of that figure. Lawrence W. Bevan declared that the modulus was about 10,000,000 lb. with a new rope, which is about the same as that stated by Mr. Behr.

W. G. Davis said that it was the practice of the Delaware, Lackawanna & Western R.R., Coal Department, to change ropes every two years or when the "stretch was out" of the rope. Every six months the rope was cut and reconed. They had been cut and coned every three months, but such frequent attention to the end of the rope was not really necessary. George S. Rice suggested the reversal of the rope, but it was not thought to be necessary where reconing was done with sufficient frequency.

Mr. Bevan said that the galvanizing of hoisting rope was of little use, for the galvanizing tends to chip off and leave the rope exposed. Few galvanized ropes are made in America. The treatment reduces the strength from 7½ to 10 per cent., depending on the size of the rope. Mr. Hart said that 120 long tons per square inch was the highest ultimate stress sought for in flat ropes. The manufacturer does not prefer, as Mr. Bevan explained, to sell ropes capable of withstanding such high stresses, because they contain much carbon and are apt to crystallize and then break on reverse bending.

A rope with a high ultimate tensile stress is deceptive. The purchaser tends to load it with a proportional stress, but under the actual conditions of working its ability to bend repeatedly around the sheaves and the drum to unbend and to resist shocks is as important as its tensile strength, which is apt to be all that is considered. Mr. Behr pointed out that at first, when only static stresses were considered, it was thought that a rope should be tapered so as to be of least diameter near the cage and of largest diameter at the drum.

IT WAS found, however, that because of the dynamic strains set up in starting the cage it was the section of rope near the cage which tended to break. As was also pointed out, a place in the rope which suffered much from stress was the part where the rope left the sheave when the cage was suspended at the upper landing. This part of the rope quite frequently gave out.

It was perhaps too much to say with someone, whom Mr. Behr quoted, that ropes should be tapered in the reverse direction to that suggested by the static stress. Much truth, however, often lies in exaggerations. The dynamic stress seems to be severest near the cage or not far from it. B. F. Tillson produced tests made by the New Jersey Zinc Co. to show that there was still much strength in ropes with several broken strands. George H. Deike, of the Mine Safety Appliances Co., Pittsburgh, Penn., gave an admirable paper on the electric safety mine lamp, for which appliance little, indeed, needs to be said, because it seems to fill almost every want except gas detection. Even cheapness of operation seems to be clearly proved to the satisfaction of everybody. We can lop off Mr. Deike's claims that the use of the lamp has cured nystagmus—a disease, probably a germ disease, which we do not have in the United States. We can, with George S. Rice, discount Mr. Deike's claims that tuberculosis is caused by foul-smelling oil lamps. People are always willing to associate smells with germs, but the association is not any too sure. Most perfectly palatable milk and water often carry the most deadly germs, and the smells often exhibit only the death of the microbes and only attest more obviously their state of harmlessness. The smoke from oil lamps may well cause miner's asthma, but certainly not tuberculosis. Mr. Rice declared that tuberculosis had been proved to be a disease from which coal mine workers are almost entirely exempt.

BUT even with nystagmus and tuberculosis, as reasons for installing electric lamps, entirely disposed of, there remain a long line of valid reasons which Mr. Deike most adequately explained. Perhaps one of the most vital of these is the rebate granted by the insurance companies to those institutions which install electric lamps. It is true, as Mr. Deike and G. S. Rice explained, that good ventilation is not a complete antidote to the risk of sudden gas emanation at the face. Safety lamps are absolutely necessary where large outflows are apt to occur and are advisable everywhere because they make safety doubly secure, and they give a good light without the time wasted on the trimming of the lamp, which with acetylene lamps is quite an important drawback. Of course, much care must be taken against putting men to draw pillars where the air may be vitiated by blackdamp. In such places the character of the air must be tested frequently with a flame lamp to avoid the possibility of asphyxiation.

Mr. Bright, of the Westinghouse Electric and Manufacturing Co., spoke most acceptably on provisions against electric dangers in the mine. He did not seem enthusiastic about explosion-proof motors, and preferred to seek safety in increased ventilation. As far as the mining machines are concerned, complete success in flameproofing can be obtained, but the risk of setting fire to methane by the arc from broken trailing cables will be just as imminent as ever.

Moreover, the cutting of sulphur balls will still cause a shower of sparks at the face. Mr. Rice doubted if sparks from the cutting of a sulphur ball would ignite gas. He thought perhaps they were more brilliant than intense, but someone from the anthracite region declared that the sparks when the cutter strikes a sulphur ball frequently ignite the gas, though, of course, with good ventilation no accidents are caused by this.

Mr. Bright said that while storage batteries did not spark there were sparks made by the use of brakes and by the controller. However, in flat seams the braking would not be frequent or objectionable, and, as the speaker pointed out, would be low down in the roadway and therefore not as dangerous as trolley sparks. He said that concentric cables would be safer for trailing purposes than are twin cables. However, they would be harder to repair and somewhat more costly to instal.

Spontaneous Firing of Coal

By DR. J. S. HALDANE
Doncaster, England

SYNOPSIS—*Certain coals are readily susceptible to spontaneous combustion; others fire with difficulty. Some of the precautions that should be taken to prevent spontaneous fires underground are here enumerated.*

THE Doncaster (England) Coal Owners' Research Laboratory was established in 1913. Since then 13 papers on the conditions under which spontaneous fires in coal occur have appeared in the *Transactions* of the Institution of Mining Engineers. The general results so far reached were reviewed in a paper presented on June 15, 1917, at a meeting of the Institution by Dr. J. S. Haldane, who is the director of the Doncaster Laboratory. Some excerpts from Dr. Haldane's paper are presented here.

IT is well known that only certain varieties of coal are readily liable to spontaneous heating. It is equally well known that in practice coal does not fire spontaneously in the absence of oxygen, or if the coal is in large lumps, or is freely exposed to the air in a layer not exceeding a certain depth depending on the nature of the coal and the degree to which it is broken up. For many years there has seen no practical doubt that the spontaneous heating of coal is due to an oxidation process occurring under such conditions that the heat formed by the oxidation cannot escape as rapidly as it is liberated.

In order that spontaneous fires in coal may occur, there must not only be coal which is capable of firing, but this must be finely broken, in sufficient amount, with sufficient heat insulation and a sufficient supply of oxygen. In the actual working of a mine one or another of these necessary conditions may not be present.

If, for instance, the whole of a bed is removed in working, or little or no crushing of the coal occurs, there will be no spontaneous fires; and even when there is much finely divided coal in the goaf, no gob fires can occur if there is no excess of air to such places. It is quite clear, therefore, that other factors besides the liability of the coal to oxidation are of the utmost importance in determining the liability of occurrence of spontaneous fires.

The peculiarities of chemical composition which render coal liable to oxidation are not under human control; but the other factors which are essential to the actual production of spontaneous fires are under engineering control at one point or another, although sometimes the cost of effective prevention may be prohibitive.

The conditions underground are often peculiarly favorable to a cumulative heating effect; for owing to the ventilation, it is likely to happen that a continuous slow current of air passes horizontally along a layer of broken coal. The heat is thus carried forward and the temperature rises higher and higher along the course of the air current, until at a certain point a dangerous temperature is reached.

Ordinarily gob fires seem to be always produced in this way. A layer of small coal and stone 2 or 3 ft. deep, and with free air above it, will seldom heat appreciably since the convection currents in the coal are in an up and down direction, so that any heat formed escapes rapidly to the air. But when the roof has settled, and there are still conditions which cause a slow flow of air along the layer of small coal, cumulative heating will at once begin.

IT must be remembered that the heat carried forward by an air current is not merely heat measured by a simple rise in temperature in the air, but all the latent heat due to evaporation of moisture. Coal which has been considerably raised in temperature by the deposit of moisture will usually combine with a far greater amount of oxygen than at the lower temperature and will therefore continue to heat much more rapidly than would otherwise be the case. Thus the Barnsley hard coal at Doncaster takes up seven or eight times as much oxygen at the boiling point as at 86 deg. F. The same rule certainly does not apply to all other varieties of coal, such, for instance, as the Welsh steam coals.

In a thick bed of coal, or in a correspondingly deep stack of coal on the surface, it appears that there is sufficient depth for up-and-down convection currents to cause cumulative heating. Many of the fires occurring in breaks of the coal along the sides of main roads at Hamstead Colliery, as recorded by Messrs Meachem and Haldane, appear to have originated in this way, although perhaps still more were due to a constant slow current of air through breaks connected at one end with the intake and at the other with the return by the side of a stopping or overcast.

It would seem well worth while to have a chemical examination made of the coal worked at any mine to determine its tendency to spontaneous heating. The results of such an examination might be of great importance in deciding the best method of laying out and working, particularly in the case of deep beds where special difficulty in preventing trouble may be anticipated.

IF the coal is liable to heat, and particularly if it crushes easily, the method of working should be such as to reduce crushing to a minimum. This can be done by avoiding narrow pillars or ribs and protecting edges of unworked coal by stone supports to receive the pressures; also by carefully avoiding falls of roof coal if any such material has to be left. In the case of a very thick seam where the sides of a road in solid coal are liable to breaks, it may be advisable to place the main roads above or below the coal.

In order to avoid as far as possible percolation of air through goaves containing coal, it seems desirable to keep the ventilating pressure low. The flow of air through broken coal or other porous material varies

directly as the pressure. Hence a low ventilating pressure seems especially important.

In order to operate with a low ventilating pressure, it is of course necessary to have roomy roads. As a further safeguard it seems desirable to avoid as far as possible air crossings and other places where air might be slowly sucked through broken coal, and to have the cross-gates and gate roads crushed, so that they are well above the goaf.

IF by these or other means the goaf can be kept so airtight that only firedamp or blackdamp is contained in its interstices, it cannot fire. Any disused road that might serve as a channel for the access of air to the goaf should be stowed as airtight as possible. The roof should be allowed to settle down evenly behind an advancing face, with a minimum of breakage of any roof coal left. To this end all props should be drawn. Gob fires have often been found to start near a prop which has been left in place.

When a seam is not flat or where faults are encountered, the control of spontaneous combustion becomes more complex, since convection currents due to difference of temperature must tend to cause air currents in the goaf and coal may have to be left near a fault. Much study of the conditions will be required in order to find means of meeting these conditions by suitable methods of working.

Gob fires could of course be entirely avoided if it were possible to remove the whole of the coal, good and bad, including slack. Considering the potential value of even the most inferior coal, it is a national reproach that any coal should be wasted by being left underground or in wasteheaps on the surface.

But for this condition it is not merely the mining engineer who is to blame. The proper utilization of coal of every sort, and especially inferior coal which is at present wasted instead of being made to yield up its potential energy and valuable byproducts, is a national problem which is now claiming more and more attention. With the gradual solution of this problem we may hope that the necessity for troubling about gob fires will to a large extent disappear.

Practical experience has shown that when from any cause the temperature of broken coal has been raised, even after long previous exposure to air, spontaneous firing is apt to occur. This is now much more intelligible; for although previous exposure to air may have exhausted the substances oxidizable at an ordinary temperature, the rise of temperature renders further substances liable to oxidation, so that this process is again started.

Coal that has been warmed by the sun, or by proximity to some source of heat, may thus easily fire under favorable conditions. In warm weather special care is needed not to stack coal in too thick a layer, although coal which has once been well exposed to air in a not too thick layer will be all the safer afterward, so that the height of the stack can safely be added to. The reasons for avoiding heat by the sun or breakage of coal when a cargo is shipped are now evident. The reason why the height of a large stack of coal can be safely increased if efficient means are taken for the ventilation of the stack are equally evident.

DIRTY WORK

By Berton Braley

There's some must do the dirty work
A-puttin' in their time
In gloom an' damp an' heavy murk
An' muck an' dust an' grime.
There's some must get their hands all soiled
Around this earthly scene,
So that the guys that never toiled
Can keep their fingers clean.

We ain't no gang for pretty looks,
For gettin' out the coal
Don't make you fit fer fashion books
Or ballrooms, on the whole;
But dirt outside don't count so much,
We'd rather be that way
Than like some well-dressed swells and such
Who'd sell their souls fer pay.

The kind of dirty work we do
Makes earth a better place,
But dirty work like they puts through
Brings foulness an' disgrace;
They sneers at us, the high-toned snobs,
Fer that's the way life goes;
But God, who sizes up our jobs,
He knows the truth, He knows!

Some must get their hands all soiled

Dirty work like they puts through

Scores the Fuel Administration

In a newspaper article in the Washington *Post*, a writer by the name of Ryley Grannon takes a fling at the accomplishments of the Fuel Administration in a somewhat satirical way. Following is the article in its entirety.

Those individuals and corporations who assert that the Fuel Administration is not handling the coal question properly are slackers and German spies. If a search were made, probably it would be discovered that everybody who has criticised the Fuel Administration has a German name or is related by marriage to somebody with a German name.

Prof. Harry A. Garfield was conscripted from the head of a college and brought here to settle the price of wheat. He had no sooner done that than he was appointed Fuel Administrator. This was on Aug. 21.

In the brief interval that has elapsed he has issued at least 14 publications, dated Sept. 6, 7, 10, 11, 13, 14, another on the 14th, 17th, 19th, another on the 19th, 20th and 22nd.

There was another, publication No. 4, but the President did not like it and tore it up.

Fourteen out of 15 shots is pretty good at any kind of game.

The publications tell everything that anybody ought to have a right to know about the Fuel Administration. They tell the public what Professor Garfield intends to do when he gets ready to do it. No. 1 starts out boldly, for instance, by asserting that "the demand for coal has vastly increased," and then saying: "It is the purpose of the Fuel Administration to encourage production."

At that time the production of soft coal was about 1,900,000 tons a year, and it is now less than 1,700,000 tons, with strikes threatened. But wait! You haven't read all the publications. Look at No. 2. It speaks of the regulation of coal. Professor Garfield begins to exhibit his Napoleonic strategy. He announces that he will appoint a committee of 10,000 men to regulate coal. If it is a big job, why not appoint a big committee? Simple but majestic thought. A man in every state, he to choose a committee in every county, they to choose a committee in every town of over 2500 population, and there you are.

In due time, say 1920 or 1921, the ten thousand committeemen may have been able to exchange views, discover that there is some difference of opinion among them, and refer the whole subject to a national convention for further ingestion, digestion, evisceration, deglutition, desiccation and evaporation.

While the noble 10,000 are at their labors let us hurry on, as Professor Garfield's publications are coming out and we cannot afford to get behind. No. 3 intimates that local committees will look into costs. "It is obvious that these will vary considerably between localities," says the Fuel Administration. Pressing on, publication No. 4 discovers Judge Lovett, ogre of the Priority Board. With one punch Judge Lovett is knocked over, and Ohio is assured that slack coal will be released.

In the meantime the public has heard of Professor Garfield, and an insatiable demand has arisen for details concerning his biography, personality, literary and carbon attainments, color of hair and college degrees. Therefore publication No. 4 endeavors to satisfy this demand. It gives a compact but careful review of the principal events in Professor Garfield's life, including the fact that he was born in Ohio, went to school, married, reared a family, studied law, and so forth.

A few other biographies have been issued by the literary and biographical department of the Fuel Administration, but none is quite so complete and well balanced as that of Professor Garfield, unless it is the account of the life achievements and intellectual equipment of Harry Dwight Nims.

Publication No. 11, issued for immediate release to a waiting world, announces that Harry Dwight Nims is assistant to Professor Garfield, and beginning with his birth in New Hampshire on a pleasant September day in 1875, the story meanders down to the statement that Mr. Nims wrote a book on "Unfair Competition."

Then this vitally important announcement is made to the consumers of soft coal throughout the United States:

"A few days ago the second edition of his book on 'Unfair Competition' appeared." Now is the time for all good men to grab a copy of the second edition.

Unfortunately, in spite of the extreme care of the statistical section of the literary and biographical section of the Fuel Administration, an error crept into the biograph of Harry Dwight Nims. It had been stated that he was appointed assistant to Professor Garfield on Sept. 24, when as a matter of authentic history the appointment was made on Aug. 24. Accordingly a new publication, No. 13, makes the correction, and history is kept on an even keel.

Carping critics say that the production of coal is diminishing while the Fuel Administration is devoting its time to biography. But that is a mere detail. The public must be made acquainted with the Fuel Administration before the Fuel Administration can be expected to have the confidence of the public. The threatened strikes can be adjusted later. The operators are closing down mines, and there is some indication that poor people will be without coal in some of the cities by the middle of winter. The prairie towns may have to burn corn on the cob. There may be coal riots, and some of the industries may have to shut down. But there is no absolute certainty that any of these things will happen, while it is a certainty that the Fuel Administration has issued important biographical data setting at rest many questions which might have come up to vex and perplex posterity.

Longevity Among Anthracite Miners

Some interesting facts on longevity among coal miners have been compiled by the Anthracite Bureau of Information in Wilkes-Barre. The recent retirement from active service of W. D. Owens, superintendent of the Lackawanna division of the Lehigh Valley Coal Co., serves to call attention to the number of workers who have filled out long careers in the anthracite mines. Owens has served as foreman and superintendent for 39 years, and, although he has turned over the active duties of his position to his successor, he is to remain with the company in an advisory capacity.

A few weeks ago occurred the death of John T. Williams, of Lansford, a pioneer miner in the Panther Creek Valley. He was 75 years old and had spent 67 years as an employee in the mines, and had been with the Lehigh Coal and Navigation Co. for 65 years. During the past year, because of deaths in his family, Thomas Parry, of Nesquehoning, decided to move from the anthracite field to make his home with a relative. The decision to quit the mines came after a period of 62 years had elapsed since he first commenced work in them as a boy.

A long stretch of time marks the service period of Robert T. Smiles, of Pittston, who lately resigned his position with the Pennsylvania Coal Co. after being continuously employed for 61 years. Smiles began work as a report boy and had filled most of the positions in and about the mines. For 34 years he had been continuously employed as an engineer at the one mine.

COMING MEETINGS

Illinois Mining Institute will hold its fall meeting Nov. 17, at Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Institute of Electrical Engineers will hold its next meeting Oct. 8, at Bellevue-Stratford Hotel, Philadelphia, Penn.

American Association of Mechanical Engineers will hold its annual meeting Dec. 4 to 7 at the Engineering Societies Building, New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

American Institute of Mining Engineers will hold its next meteing at St. Louis, Mo., Oct. 8 to 13, with headquarters at the Planters Hotel. Secretary, Bradley Stoughton, Engineering Societies Building, New York City.

Who's Who In Coal Mining

Rembrandt Peale

Rembrandt Peale, who is representing the bituminous operators on the staff of the Fuel Administration, was born in Lockhaven, Penn. His early education was obtained in the public schools at that place. Later he attended Lehigh University at South Bethlehem, from which institution he was graduated in 1883 with a B.S. degree. He then spent one year in the law school of the University of Pennsylvania.

After three years in general business, he was elected treasurer of the Bloomington Mining Co. and began active work in the offices of the company in Philadelphia in 1887. The properties operated by the Bloomington Mining Co. formed the nucleus of the properties at present operated by Peale, Peacock & Kerr.

Mr. Peale's capacity for handling general problems confronting the coal industry was clearly revealed during the negotiations which led to the formation of the Tidewater Coal Exchange. His ability in this connection resulted in his being selected as the commissioner in charge of the Exchange. The success which has marked the pooling arrangement was another evidence of Mr. Peale's ability and was the direct cause of his selection by Dr. Garfield to advise him on matters which concern operators.

Harry D. Nims

Harry Dwight Nims, who was appointed an assistant to Fuel Administrator Garfield, Aug. 24, 1917, was born at Keene, N. H., 1875. He was educated in the public schools of Concord, N. H., and at Williams College, from which he graduated with the degree of A.B. in 1898.

During his college years he spent most of his vacations in business, largely traveling as a salesman. In the fall of 1898 he came to New York City, and entered the office of Bergen & Dykman, 189 Montague St., Brooklyn, N. Y., where he worked as a clerk and studied law at the same time, attending the New York University law school in the evenings. He was admitted to the Bar of the State of New York in 1901, and shortly thereafter opened an office for himself at 32 Nassau St., New York City. About 1905 he became a partner in the firm of Nash & Jones, 63 Wall St., New York City, where he continued for about three years.

During this period he published a law treatise under the title of "The Law of Unfair Competition." This book was the first to be published in this country devoted exclusively to this body of law. About 1908 Mr. Nims left Nash & Jones, and resumed practice under his own name at 32 Nassau Street.

Mr. Nims lives at Bronxville, Westchester County, N. Y., and is a member of the University Club of New York City, the New York City Bar Association, St. Andrews Golf Club, and Williams Club.

In 1915 he was given an honorary degree of Master of Arts by Williams College, in recognition of his work on "Unfair Competition" and similar subjects.

Some Interesting Statistics

The figures given in the tables below require no explanation, and should prove of more than passing interest to both coal operators and mine workers at the present time.

THICK VEIN, SOUTHERN ILLINOIS

Sales Price, by Years (April 1, 1910, to June 30, 1917), Compared with Figures from State Coal Reports, Showing Number of Days Worked Annually, and Advancing Mining Rate and Total Labor Costs

	Tonnage Thick Vein	Total Cost, Average, Thick Vein	Average Sale Return, Thick Vein	Days Worked, State Average	Average, State Mining Rate	Approximate Total, State Labor Cost Only
April 1, 1910, to March 31, 1911[1]	.....	.....	$1.39	169	$0.627	$0.8778
April 1, 1911, to March 31,1912	.....	.....	1.18	172	.636	.8904
April 1, 1912, to March 31, 1913[2]	2,813,359	.....	1.25	179	.664	.9296
April 1, 1913, to March 31, 1914[3]	4,152,030	.....	1.209	174	.657	.9198
April 1, 1914, to March 31, 1915[3]	4,444,034	.....	1.164	172	.666	.9324
April 1, 1915, to March 31, 1916[3]	5,899,722	.....	1.18	185	.670	.9380
(Approximately 10c. per ton advance on wage scale and material expense.)						
April 1, 1916, to March 31, 1917[4]	8,922,424	1.30	$1.693	...	$0.710	$0.9940
(Approximately 25c. per ton advance on wage scale April 16, 1917—New York Agreement.)						
April 1, 1917, to June 30, 1917[4]	2,765,273	$1.749	$2.449	.....	.....	.....

[1] From date prepared (1915) in connection with Interstate Commerce Commission Case, Docket No. 555.
[2] Five companies operating nine mines.
[3] Six companies operating ten mines—April, 1913, to March 31, 1916.
[4] Twelve companies operating nineteen mines.

THICK VEIN, SOUTHERN ILLINOIS COAL

Cost of Production from Available Sheets for the Three-Month Period of April, May and June, 1917, Covering an Output of Approximately 4,000,000 Tons

Labor	$0.970
Supplies	.157
General office and sales	.122
Plant depreciation, regular	.05
Plant depreciation, special	.05[1]
Land depletion	.10[2]
Liability insurance	.05[3]
Tax and insurance	.05[4]
Property hazard	.05[5]
Interest on investment	.15[6]
Total	$1.749

[1] All equipment purchases properly chargeable to capital account and bought under present premium price market conditions develop excess cost that must be charged off during the contemplated war period, which is estimated will be at least one year.
[2] In view of the privilege existing under rulings of the Federal Treasury Department that, regardless of any established rate of depletion, deductions must be discontinued when total property valuation established as of 1913 had been reached, the majority of companies elect to avail themselves of such privilege to promptly charge off land values.
[3] Increased to provide anticipated advance in liability expense as a result of the new Compulsory Compensation Act passed by the last Legislature and effective July 1, 1917.
[4] To provide proper reserve to meet anticipated capital stock, income and other tax, *but not including excess Profit Tax.*
[5] Advance on basis of general experience the past two years, during which special study has been made and data accumulated.
[6] The average plant investment is $2.50 for every ton of coal produced annually. The rate used is 6 per cent.

HOUSEHOLD COMMODITIES

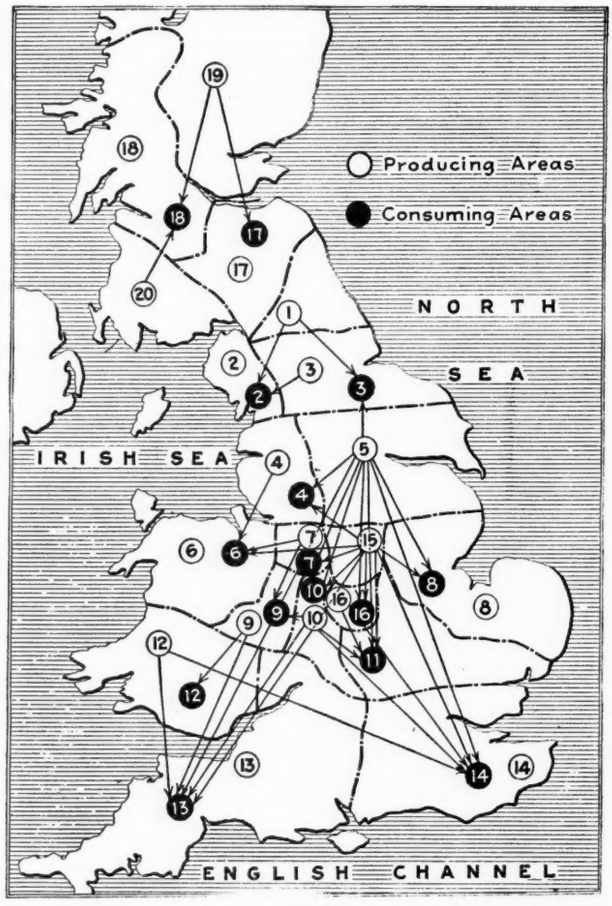
	1917	1916	1915
Potatoes, new, per bushel	$3.50	$1.35	$0.50
Soap (American family)	4.10	2.89	2.89
Tomatoes, canned, doz	2.40	1.75	1.55
Corn, canned, doz	1.90	1.35	1.35
Peas, canned, doz	2.25	2.00	1.60
Sugar (bbl.), lb	.097	.0783	.0635
Rib roast, per lb	.28	.26	.222
Pork, loin	.30	.28	.22
Flour, per 25 lb	2.20	1.80	1.05
Butter, per lb	.50	.35	.28
Eggs, per doz	.42	.25	.25
Bacon, per lb	.44	.26	.22
Lard, per lb	.25	.18	.....
Women's shoes	8.00	6.00	.....
Beans, per lb	.35	.10	.....
Sugar	.10	.07	.....
Gasoline, per gal	.20	.185	.085
Cresol, dip, per gal	.80	.45	.40
Road oil, per gal	.105	.080	.06
Middlings, per ton	50.00	50.00	28.00
Stain, per gal	.99	.....	.80
Hogs, per 100 lb. (mar)	14.50	8.90	.....

A study of the local geology at Pittsburgh is being made by J. W. Paul, of the Bureau of Mines, to determine the probable horizon of the lower coal measures

How the British Government Distributes Coal

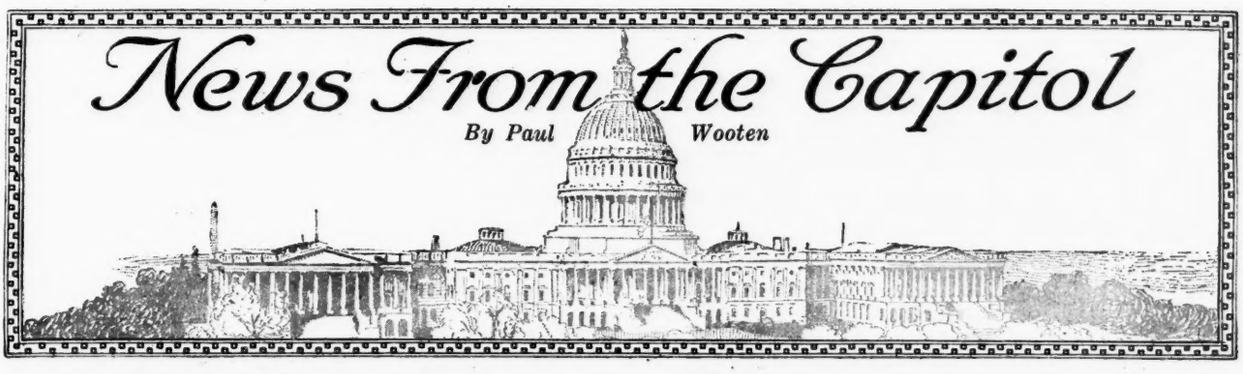
BEGINNING Sept. 8 of this year, no one in the British Isles can buy British rail-boren bituminous coal for use in any district except from one of the districts designated under the Coal Transport Order of July 4, 1917. Thus district No. 14, comprising the Southeast counties and London, can buy from mines in No. 5 (Yorkshire), No. 15 (Derbyshire and Nottinghamshire), No. 16 (Leicestershire), No. 10 (Birmingham district) and No. 12 (South Wales and Monmouth); also, of course, from mines in its own district, No. 14, which includes the Kent coal field. No coal can be brought in from Shropshire, North Staffordshire, North Wales, Lancashire or any points north of these. The coals of the whole Northumberland field and the Scotch coals are closed to London unless brought in by boat. Conversely, no one can sell coal except in the districts apportioned by the Controller of Coal Mines to the area in which his colliery is located. In order to make the ruling duly binding, no one can even offer to buy or sell, the proposal to violate the law being a misdemeanor of the same character as an actual purchase or sale. However, with the consent of the Controller of Coal Mines, these regulations can be modified wherever such a change seems desirable. It must be noted that the transport only applies to coal for inland consumption and none of the regulations applies to anthracite or coke. There are 20 areas in all. Some areas, like the Northeast area, No. 20, which includes the bulk of Scotland, can sell only in two districts, both of which are north of the Tweed. The Scotch cannot buy English or Welsh soft coal nor sell coal to England or Wales unless it is either for use at sea or for export or is transported by water. The Scotch are well supplied with coal and doubtless can get along nicely without coal from England and the converse is also true. The provisions are well summarized in the accompanying table.

The new order required that every contract that traversed its requirements should be abrogated. There is no constitution in Great Britain preventing such drastic action. The coal operators were ordered to make new contracts dating from Monday, Sept. 10 onward. It is hoped by the methods adopted that 700,000,000 ton-miles will be saved annually. It will be noticed that some producing areas in the plan, like No. 13 (Southwestern counties) and No. 14 (Southeastern counties and London), are without any connecting lines and arrows. This means that they cannot ship outside their own confines. The Somerset fields in No. 13 district are of no consequence, and the Kent fields in No. 14 district are only a drop in the bucket when the output required for London is considered. Consequently there is no need for either of them to be permitted to sell outside the districts in which they are located. District Coal and Coke Supplies Committees are appointed in all the districts of England, the Yorkshire district being divided, however, for the purpose of this administration. Scotland is controlled apparently by a single committee with a secretary resident at Glasgow. These committees will apportion the coal of the collieries at their discretion, the Controller of Coal Mines having furnished them with details with regard to "the present distribution of certain special descriptions and qualities of coal that are required for certain purposes, such as for coke ovens, gas producers and automatic stokers and the names of firms who are entitled to priority in respect of their requirement of such fuel."



Areas to Which the Forwarding of Coal by Public Railway for Inland Consumption is Confined by These Directions

Area of Production No.	Steam and Manufacturing Area No.	Gas and Coking Area No.	House Area No.
1. Northumberland	1, 2, 3	1	1, 2
2. Cumberland	2	2	2
3. Durham	2, 3	2, 3	2, 3
4. Lancashire	4, 6	4	4
5. Yorkshire	3, 4, 5, 7, 8, 10, 11, 14, 16	4, 5, 7, 8, 10, 11, 13, 14, 16	4, 5, 7, 8, 10, 11 14, 16
6. North Wales	6	6	6
7. North Stafford	6, 7, 9	7, 9, 10	6, 7, 9
8. Eastern Counties			
9. Shropshire	9, 12, 13	9, 13	9, 12, 13
10. Birmingham and District	9, 10, 11, 13, 14		9, 10, 11, 13, 14
11. Northants to Essex			
12. South Wales and Monmouthshire	12, 13, 14	12	12, 13
13. South Western Counties	13	13	13
14. South Eastern Counties and London	14	14	14
15. Derby and Nottingham	4, 6, 7, 8, 10, 11 13, 14, 15, 16	4, 7, 8, 10, 11, 14 15, 16	4, 6, 7, 8, 11, 14, 15, 16
16. Leicester	10, 11, 14, 16		10, 11, 14, 16
Scotland			
17. South Eastern	17	17	17
18. North Western	18	18	18
19. North Eastern	17, 18, 19	19	17, 18, 19
20. South Western	18, 20	20	20



[*Many of the activities in the National capital are of such importance to the coal-mining industry that an increased allotment of space is being given to our Washington correspondence. The Washington Bureau of "Coal Age" is in charge of Paul Wooton, whose office is centrally located in the Metropolitan Bank Building. Complete files of "Coal Age" as well as books of reference likely to be of service to coal men may be found there. Mr. Wooton is in a position to be of material assistance to those who have business to transact with Government officials. Have your mail addressed care of Mr. Wooten while at the capital.—Editor*]

Retail Prices Are Now Fixed

On Sept. 30 H. A. Garfield, the fuel administrator, issued an order describing the method by which retail coal and coke dealers shall fix their maximum gross margins; that is, the difference between the average cost of coal or coke at the retailer's yard, wharf or siding, and the price at which it is sold to the consumer.

Under the plan announced, the retailer ascertains his retail margin in the year 1915, when more normal conditions prevailed than at present. To this he may add not to exceed 30 per cent. of that margin, which, of course, includes his profits at that time. It is provided, however, that in no case shall the gross margin added by any retail dealer exceed the retail margin added by him during July, 1917.

The first consideration of the Fuel Administrator must be to get coal to the consumer, and the dealers cannot be expected to make the extraordinary efforts which they must make this winter, if everybody is to get coal, unless they are given a reasonable profit.

Mr. Garfield believes that this plan will result in determining at once in each community a retail margin fair to both the consumer and the dealer; and that, this being a fact, the public uncertainty regarding retail coal prices, and the uncertainty as to whether or not to buy, will be entirely removed.

It is possible that in some communities the percentage of increase of the present cost of retail coal business is more than 30 per cent. in excess of the cost in 1915. When this can be clearly demonstrated, the local fuel administrator will be empowered to recommend a readjustment. All such readjustments must be taken up in the first instance with the local committees to be appointed by the state fuel administrators. Readjustment, also, will be made whenever the Fuel Administrator learns that the retail margin added by any dealer is too high. In this connection Mr. Garfield stated emphatically that in fixing this margin the dealer is under no obligation to increase his 1915 margin by the full 30 per cent. The addition of that per cent. represents the maximum permissible margin.

Mr. Garfield has found the retail dealers for the most part ready and willing to coöperate, and he believes that they will fix their margins under this order at such figures as to compel public confidence. He expressed the hope, and is advising, that local committees appointed by the state fuel administrators will in each case avail themselves of the advice of an experienced retail dealer in conducting investigations. Accountants will at once begin to investigate the retail conditions of the country. Retail dealers will be called upon to return sworn cost sheets showing the facts upon which they have based their margins. These cost sheets will be returned under penalties which will be strictly enforced.

The formal order to retailers issued by the Fuel Administrator regulating retail margins is as follows:

To all persons, firms, corporations and associations engaged in the handling and sale of coal or coke at retail, hereinafter referred to as retailers or retail dealers:

The President of the United States in pursuance of the provisions of the act of Congress approved Aug. 10, 1917, entitled "An act to provide further for the national security and defense by encouraging the production, conserving the supply and controlling the distribution of food products and fuel," and particularly for the purpose of carrying into effect the provisions of said act relating to fuel, having on the 21st day of August, 1917, fixed the price at which bituminous coal may be sold at the mouth of the mine, and having on the 23d day of August, 1917, fixed the price at which certain sizes of anthracite coal may be sold at the mouth of the mine on and after the first day of September, 1917, and, by the same order, having fixed the amount which may be paid as commission to jobbers, now, in furtherance of the purpose for which said act was passed and by direction of the President of the United States, the Fuel Administrator hereby orders and directs:

On and after the first day of October, 1917, in making prices and sales to consumers, the retail gross margin (as hereinafter defined) added by any retail dealer to the average cost (determined as hereinafter provided) of any size or grade of coal or coke for each class of business shall not exceed the average gross margin added by such dealer for the same size or grade for each class of business during the calendar year 1915, plus 30 per cent. of said retail gross margin for the calendar year 1915; provided, however, that the retail gross margin added by any retail dealer shall in no case exceed the average added by such dealer for the same size, grade, and class of business during July, 1917.

By this order, retailers are required to fix a retail gross margin which may be less than, but shall not in any instance exceed, the margin added by them in 1915 plus 30 per cent. thereof.

Definition of Retail Dealer—Every person, partnership, corporation or association physically receiving, handling and delivering coal or coke to consumers is a retail coal or coke dealer within the meaning of this order.

Definition of Retail Gross Margin—The retail gross margins of the different classes of retail coal and coke dealers are defined as:

1. The difference between the price charged by a retail coal or coke dealer to consumers and the average cost of coal or coke to such retailer, free on board railroad cars at his railroad siding, yard, pocket or trestle, when such coal or coke is received by him by rail.

2. The difference between the price charged by a retail coal or coke dealer to consumers and the average cost of coal or coke to such retailer free alongside his wharf, pocket or water yard, when such coal or coke is received by him by water.

3. The difference between the price charged by a retail coal or coke dealer to consumers and the average cost of coal or coke to such retailer at wholesalers' pockets, trestles, railroad sidings, mines, tipples, dumps, docks, yards or wharves.

How Retail Dealers Shall Ascertain Average Cost of Coal or Coke—The average cost of coal or coke to retail dealers, to which the gross retail margin may be added, shall be ascertained by them for each size and grade on the first and sixteenth days of each calendar month, according to the following method:

The tonnage and average cost of coal or coke on hand at the beginning of a period is to be combined with the tonnage and average cost of coal or coke received during the period.

EXAMPLE

Egg Coal

	Tons	Total Cost	Average Cost per Ton
On hand Oct. 1	100	$600.00	$6.00
Received Oct. 1 to 15, inclusive	300	1,500.00	5.00
Total	400	$2,100.00	$5.25
Sold Oct. 1 to 15, inclusive	350	.....	.....
On hand Oct. 16	50	$262.50	$5.25
Received Oct. 16 to 31, inclusive	300	$1425.00	4.75
Total	350	$1,687.50	$4.82

In the above example, the average cost per ton of egg coal to which the gross margin should be added for sales during the period Oct. 1 to Oct. 15 inclusive is $6; during the period Oct. 16 to Oct. 31 inclusive, it is $5.25; and for sales during the period Nov. 1 to Nov. 15 inclusive, the average cost is $4.82. The same method of computation must be applied by each dealer in ascertaining his average cost of each size and grade of coal or coke.

Reports—From retail dealers in various sections of the country monthly reports will be required by the United States Fuel Administrator and the Federal Trade Commission, on blanks to be supplied for this purpose. On these forms, the dealers must return the cost of coal or coke received by them, their sales prices and their gross margins. Whenever necessary, supplementary reports on accounting forms provided therefor will be required to show the actual cost of conducting the retail business and other information which may be required. The accounting forms will contain directions as to returning them to the state fuel administrators.

Retail Dealers Beginning Business Since 1915—Any persons, firms, corporations or associations not engaged in the retail coal or coke business before Jan. 1, 1916, and consequently unable to determine their retail gross margin during 1915 by the method above described, shall return at once to the Fuel Administrator at Washington, D. C., a sworn statement of the average retail gross margin which they have received during the period they have been in business on each grade and size of coal and coke and for each class of business. Pending investigation and action upon this information, such retail dealers may continue to sell coal or coke at a gross margin not to exceed the average gross margin which they have received during said period; provided, however, that the above-mentioned increase of 30 per cent. shall not be added by them to such margin, and that the retail gross margin added by such persons, firms, corporations or associations to their average cost of coal or coke shall not in any case exceed the average retail gross margin added by them for the same size, grade and class of business during the month of July, 1917.

Retailers' Contracts with Consumers—Contracts between a retail dealer and a consumer made before this date are not affected by this order, provided that such contracts are bona fide in character and enforceable at law.

In making deliveries of coal or coke under such contracts, a retail dealer will be expected to supply only the minimum amount of any coal or coke which under the terms thereof he can be obliged to deliver unless and until he has met the reasonable requirements of other consumers desiring to purchase coal or coke from such dealer.

Immediate investigation into the cost of local distribution and the profits of retail dealers will be made by the state fuel administrators acting through local committees and with the aid of accountants. The state fuel administrators will be charged with the duty of recommending to the Fuel Administrator remedies for all abuses and avoidable hardships arising under the operation of this order.

New Bituminous Coal Classifications

The Fuel Administrator announces further classifications of bituminous coal within several outlying fields, on the lines heretofore laid down by the President in fixing the prices of coal. The conditions in the fields named below are exceptional, and do not affect the prices heretofore fixed by the President in the principal bituminous fields. If upon completion of the investigations, now being made of operators' costs in the fields affected, it is found that these changes are not justified, further modifications will be made at once. These prices became effective at 7 p.m., Oct. 1, 1917.

	Run-of-Mine	Prepared Sizes	Slack or Screenings
Pierce and King Counties, in the State of Washington	$3.25	$4.50	$3.00
Lafayette, Ray, Clay, Platte and Linn Counties in the State of Missouri	3.15	3.40	2.90
Appanoose, Wayne, Boone and Webster Counties, in the State of Iowa	3.15	3.40	2.90
Thin vein seams at Hartford, Midland, Hackett, Greenwood and Denning, in the State of Arkansas	3.05	3.40	2.40
Leflore and Haskell Counties, in the State of Oklahoma	3.50	4.30	2.25
Okmulgee and Tulsa Counties, in the State of Oklahoma	3.10	3.90	2.00
Coal County, in the State of Oklahoma	3.30	4.10	2.00
Pittsburgh and Latimer Counties, in the State of Oklahoma	3.50	4.30	2.25
Bituminous domestic coal mined in the Walsenberg, Cannon City, Rout, Garfield, Gunnison, Durango, Mesa, Pitkin, Montezuma, Delta, Montrose and Rio Blanca Districts, in the State of Colorado	3.00	4.00	1.50
Bituminous steam coal mined in the Trinidad District, in the State of Colorado	2.75	3.25	2.00
Lignite coal mined in the Northern Field and El Paso Districts, in the State of Colorado	2.45	3.50	1.00
Osage County, in the State of Kansas	2.55	4.00	2.30
Big Seam District, in the State of Alabama	2.15	2.45	1.85
Pratt, Jaeger, Jefferson, Nickel Plate and Coal City Districts, in the State of Alabama	2.35	2.65	2.05
Cahaba, Black Creek, Brookwood and Blue Creek Districts, in the State of Alabama	2.85	3.10	2.45
Coronoa District, in the State of Alabama	2.40	2.75	2.05
Montevallo District, in the State of Alabama	2.40	4.00	2.15
State of Wyoming	2.50	3.50	1.25

	Brazil Block	Slack or Screenings
Brazil block field, in the State of Indiana	$2.95	$1.70

The Fuel Administrator also announces the following: Smithing coal may be sold, until further order, at the prevailing market price. Cannel coal may be sold, until further order, at the prevailing market price.

New Ruling on Anthracite Coal

Reductions have been ordered in the price at which Pennsylvania anthracite pea coal may be sold f.o.b. the mines. Hereafter the maximum f.o.b. mine prices in the several fields will be as follows:

White Ash	$3.40
Red Ash	3.50
Lykens Valley	3.75

Producers to whom a differential of not to exceed 75c. was permitted in the President's order of Aug. 23 may continue to add the same differential to the above prices.

The following is the official order, in full:

To all persons, firms and corporations engaged in the mining and production of coal in the State of Pennsylvania:

The President of the United States having heretofore, on or about the 23d day of August, 1917, by virtue of the provisions of an Act of Congress approved Aug. 10, 1917, enti-

tled "An act to provide further for the national security and defense by encouraging the production, conserving the supply and controlling the distribution of food products and fuel," ordered and directed that the maximum prices which should not be exceeded in the sale of Pennsylvania anthracite pea coal should be as follows, to wit: White ash pea coal, $4 per ton; red ash pea coal, $4.10 per ton, and Lykens Valley, $4.35 per ton, when sold by certain producers specified in paragraph 4 of the President's proclamation of Aug. 23, 1917, and that when sold by any other producers the maximum price should not exceed by more than 75c. the prices mentioned above.

Now, by direction of the President of the United States, the Fuel Administrator hereby orders and directs that, until further order in the premises, the above-mentioned maximum prices for Pennsylvania anthracite pea coal be and the same hereby are modified and reduced, pending further investigation, to the following maximum prices: White ash pea coal, $3.40 per ton; red ash pea coal, $3.50 per ton, and Lykens Valley, $3.75 per ton; which said prices are to be observed by the producers specified in paragraph 4 of the President's proclamation of Aug. 23, 1917.

And it is further ordered that all other producers shall sell Pennsylvania anthracite pea coal at maximum prices not to exceed the above-mentioned maximum prices by more than 75c. per ton of 2240 pounds.

These prices shall become effective at 7 a.m., Oct. 1, 1917.

(Signed) H. A. FARFIELD.

Soft Coal Operators' Association To Boost Production

After an unexplained delay, understood to have been in deference to the wishes of the Fuel Administrator, a national association of coal operators finally is a reality. Equally unexplained is a change in name. The articles of association adopted two months ago specified that the title of the organization is to be the National Association of Coal Operators. The organization, however, emerges from a long conference with Dr. Garfield with the word operators striken from its name, the official title of the organization now being "National Coal Association."

One thing is certain, however, and that is the organization which was regarded with some question by the Fuel Administrator now is well intrenched in his good graces. A suite of offices has been secured in the Southern Building, and in a statement issued to the public the association signifies its intention to help further the coal production.

Anthracite Production Breaking All Previous Records

Anthracite shipments to New England during the first seven months of the current year were 8 per cent. greater than were the shipments to that section during the corresponding period of 1916. Completed figures showing this to be the case were issued by the Anthracite Bureau of Information, which has opened an office in the Woodward Building, in this city. During the same seven months, it also was shown that shipments to New York harbor increased 8.4 per cent. while an increase of 17 per cent. was shown in the amount of anthracite sent to the city of Philadelphia. A statement from the bureau in regard to labor conditions reads as follows:

In spite of a labor shortage of approximately 25,000 men the production of anthracite during the first eight months of 1917, by reason of the steady operation of the collieries, has exceeded any previous record for the same period in the history of the region, the quantity shipped to market up to Sept. 1 this year amounting to 51,405,341 tons, against the previous high record for the same period in 1913 of 45,709,606 tons. Compared with 1916, the shipments of anthracite this year have shown an increase of more than 7,000,000 tons, and for the first eight months of 1917 were nearly 1,500,000 tons more than in the first nine months of last year.

Fuel Administrators Are Announced for Many States

James J. Storrow, of Boston, has been chosen as fuel administrator for New England. Each state in New England will be represented on the New England Fuel committee, of which Mr. Storrow is chairman. The appointments of state fuel administrators, which have been announced, are as follows:

S. P. Kennedy, Anniston, Ala.; Thomas W. Russell, Hartford, Conn.; Dr. L. G. Hardman, Commerce, Ga.; Charles W. Webster, Waucoma, Iowa; Emerson T. Carey, Hutchinson, Kan.; J. H. Hamlen, Portland, Maine; James J. Storrow, Boston, Mass.; M. J. Swindlehurst, Helena, Mont.; Charles M. Floyd, Manchester, N. H.; A. W. McAllister, Greensboro, N. C.; Harry R. Conn, Van Wert, Ohio; P. A. Norris, Ada, Okla.; George H. Holmes, Providence, R. I.; W. W. Armstrong, Salt Lake City, Utah; H. J. M. Jones, Montpelier, Vt.; W. N. Fitzgerald, Milwaukee, Wis.; E. H. Walker, Carson City, Nev.; David Whitcomb, Seattle, Wash.

Results of Price Fixing

Edwin E. Robbins, representative from the State of Pennsylvania, is quoted in the *Congressional Record* of Sept. 28, 1917, p. 8207 as follows: ". . . On Aug. 23 of this year a price was fixed by the director of coal of $2 a ton on all the bituminous coal mined in Pennsylvania, an arbitrary price. . . . The result has been that it has diminished all the production of coal in western Pennsylvania, so that 61 mines in Westmoreland County, which I represent, have gone out of business since that price was fixed, . . . the great National Tube Works in McKeesport closing for two days because it did not have coal.

"If that policy is pursued and relief is not given to the bituminous coal interests of western Pennsylvania there will be this winter a stringency in coal that will be felt not only among the domestic consumers but among the mills and large furnaces as well."

Coal Industry Not a Slacker

That the public still has a misconception of the coal situation is the belief of George Otis Smith, the director of the United States Geological Survey. "The general impression is," says Dr. Smith, "that coal mines are producing less than usual and that the coal industry taken as a whole is almost in the slacker class. These conclusions are absolutely unjustifiable. While the rate of production of coal has varied from week to week, it nevertheless is true that, since April, the daily rate of production always has been in excess of that of last year, with the net result that on Sept. 1 the production was 35,000,000 tons in excess of that of the first eight months of 1916. This indicates indisputably that any coal shortage is caused by more coal being burned than ever before."

The Labor Situation

General Labor Situation

The Central Competitive Region has come so near an agreement that at any moment the final outcome of the conference may be announced. Concurrently affairs in Washington regarding the southeastern Kentucky and Tennessee region, which has been somewhat inadequately described elsewhere as the Jellico district, are said to have come to a fruitful conclusion.

It appears that the miners are to receive 10c. per ton advance instead of the 15c. demanded, and 20 per cent. additional on deadwork and yardage. Instead of $1.90 per day additional for daymen, $1.50 is conceded. This is an increase of 41⅔ per cent. on the $3.60 rate, the wage formerly paid to the generality of day workers. The difference between the parties seems now to lie with the duration of the contract. The operators desire that 60 days after the present international conflict is over the agreement shall automatically terminate.

Why Anticipate Wage Reduction After War?

While not keen to see any increase in wage, the public does, at least, desire that wages shall not be decreased after the war. Conditions might conceivably arise making such a change advisable, but it is to be hoped not. Neither labor nor capital would be benefited by a scaling down in wage rates. It must be remembered that every country has been feverishly increasing wages, and competition will not therefore require a reduction in wage. A defeated Germany will be at the mercy of the workingmen. Russia already is, and no one can deny that Great Britain is so controlled by the proletariat that readjustment of wages during the reconstruction period is wholly unlikely.

The assurance that wages could not be decreased would be a wonderful stabilizer of the money market. The strength of the union in the regions where the union is not formally recognized is so strong that reductions in wages cannot take place except perhaps in western and northeastern Kentucky. There is no reason to fear that the wage agreed on could not be paid after the war. It may be and is unreasonable; it demands too much for the workman-consumer who has to buy the coal, but nevertheless once established it is better to leave it where it is.

Of course, the operators have a proviso that they will not pay the increase, because they cannot afford to pay it, unless the selling rates are raised proportionately. These two difficulties hang the agreement in the air, but neither of them seem likely to be found insuperable.

Few Strikes Now Reduce the Coal Output

Short button strikes, a strike to secure the discharge of a boss and the close of the strike of firemen were salient features in the anthracite situation of the last two weeks.

The Anthracite Conciliation Board, through Charles B. Neil, its umpire, has settled the dispute regarding the pay of certain classes of employees who received the eight-hour day and 3 per cent. increase in wages at the readjustment in 1916. The timber cutters wanted a nine-hour day and a 7 per cent. increase in wage, but the arrangement was denied them by the arbitrator, who said that they did not belong to the class of operatives with which they desired to class themselves. The complainants were working for the Philadelphia & Reading Coal and Iron Co., but the decision will apply to all the companies in the anthracite region.

The lower prices in the bituminous regions of Pennsylvania have closed the smaller mines and caused others to rectify their wage schedule, and a serene peace seems to have settled over a state which, until that reduction took place, was seething with industrial disorder.

Some time ago Mine No. 2, owned by the Republic Coal Co., at Klein, near Roundup, Musselshell County, Montana, went on strike. The drivers were discontented and quit without first invoking the regular procedure set forth in the part of the contract relating to working conditions. The charter of the local was revoked. The mine workers left and enough men to man the mine could not be secured, so for a long time the mine remained closed, and the Chicago, Milwaukee & Puget Sound R.R. lost for two months the 3000 tons which the mine supplied daily. Operations started again Sept. 13 and a new local is formed. It is believed that most of the men who organized the strike will not be reëmployed by the mine owners.

A new strike has broken out in the Fernie district in British Columbia against the imposition of the Provincial poll tax and against the deduction of one day's pay for the Patriotic Fund.

Apparently the collection of the Patriotic Fund has not been entirely voluntary. The Hon. T. W. Crothers is of the opinion that it should be deducted only when those who are to pay it are willing. The poll tax is $5 per annum. It is thought that the men did not object to the Patriotic Fund, but desire to express their displeasure at being required to pay a poll tax.

The local Patriotic Fund committee agreed to return the money to those desiring it and to make no further collections from the men. The Fernie mine workers had been contributing $1000 a month.

Hard Coal Miners Are Quite Restless

Despite the heavy demand for coal, despite a contract which forbids such strikes, despite the fact that striking is practically fighting for the enemy, button strikes still occur. On Friday, Sept. 28, 3000 employees of the Truesdale colliery of the Delaware, Lackawanna & Western R.R., coal department, went on strike to compel 100 of their fellow workers to pay their union dues. The Nanticoke local is said to have authorized the strike. The strike ended on the day following, the buttonless mine workers surrendering almost immediately to the importunity of their fellow employees.

On Sept. 27 900 employees at the Bliss mine of the same company went on strike. This strike was also settled on the day following.

The Kehley's Run colliery near Shenandoah, operated by the Thomas Colliery Co., a Madeira-Hill operation, had a strike on Sept. 27 because the company would not remove a foreman who it was alleged had made an assault on one of the employees. About 600 men and boys were made idle.

The strike of the stationary firemen of the Lackawanna region, after lasting one week, ended on Sept. 28 by the men returning to work. Between 500 and 600 firemen were involved in the strike. They were demanding an increase of almost 20 per cent. in wages.

The officials of the union did not sanction the strike, but it occurred nevertheless and tied up several collieries. The men return at the old rate of wages, but with the expectation that before long they will get the coveted increase.

As It Looks in Illinois Mines

While the officers of the United Mine Workers of America in Washington are trying to get more wages for the miners, the latter are not availing themselves of their earning opportunities under the present wage scale. The operators quite generally complain that their miners are "laying down on the job." Great difficulty is experienced in getting them to work with any degree of regularity. They stay at home

whenever they "feel like it," and they feel like it frequently. And when they go to work in the morning they are as likely as not to quit at noon. Even where the car supply is scant, there is difficulty in getting the cars filled.

Different reasons are assigned by the operators for the abstentions from work. One motive, they do not hesitate to say, is disloyalty. It is freely charged that influences inimical to the Government have stirred up much trouble among the miners. Other men who are not necessarily disloyal in their intentions are willing to curtail the output, with the incidental disadvantage to the country, for the sake of impressing their power on the public and for the purpose of exacting increased wages. But probably, the greater part of the miners who are doing the "soldiering" are simply shiftless and lay off to spend the money which they are getting too easily.

The Illinois miners are represented in Washington by the entire State Executive Board, composed of President Frank Farrington, Vice President Harry Fishwick, Secretary Walter Nesbit, P. O. Francke, Michael Petsock, George Mercer, Herbert Hall, Steve Sullivan, Ben Williams, Ben Farris, Moses Johnson, Edward Dobbins, William Hutton, Eli Traut, Hugh Willis and Harry Groft.

Sam Oberdean was arrested a few days ago at Nokomis for making unpatriotic addresses and for alleged activities to hinder coal production and was locked up at Sprnigfield. Harry McWilliams, deputy sheriff of Montgomery County, assisted the Federal officials in making the arrest. McWilliams is president of the miners' union at Nokomis. On account of his action 600 miners refused to work unless he was discharged. To prevent the closing down of the mines he remained idle. The miners sent a committee of three to Springfield to intercede with District Attorney Knotts for Oberdean. He "read the riot act to them" and told them to go back home and behave themselves or the Government might be expected to lay plans for placing the mines under military control.

Wages Are Raised in Alabama

The Alabama Coal Operators' Association recently announced a 10 per cent. increase in wages, effective Oct. 1. The Tennessee Coal, Iron and Railroad Co. and the Woodward Iron Co., concerns not affiliated with the association, have announced a similar increase. In fact the initiative in the wage increase really lay with the steel corporations. In making the announcement the operators let it be known that their action was not based on or warranted by profits accruing to the industry, but solely to ameliorate as far as possible economic conditions and unrest in the ranks of the workers. The increase is also based on the assumption that such increased cost of production will be taken care of in the adjusted Government prices which it is expected will be announced in the near future.

More than 22,500 workingmen in the Birmingham district will be affected by the advance in wages of the two corporations. The other concerns which are involved in this increase employ between 5000 and 10,000 men. The payment in Alabama is based on the scale for the Pratt seam, and the rate for that bed will be 82½c. per ton.

The concession is a somewhat hopeless matter. The mineworkers would not work steadily even with the smaller wages they had prior to Oct. 1. They put in only about 60 to 70 per cent. of full time at their work. The operators have felt that they could produce all the coal desired if they could induce the miners to work 5½ days in the week.

The increased wage will only make the men less willing to work steadily. It is estimated that men who were earning from 75 to 85c. per ton were making little more pay than when they were receiving 45 to 47c. per ton. With higher rates of pay they are well content to do less work.

It is to be hoped that the wage increase will settle the unrest. The only matter the mine workers still desire to obtain is the recognition of the union. That recognition should not be sought during the war. The committee appointed by the mineworkers' convention to visit Washington and secure, if possible, an adjustment of differences —of which recognition was the crowning sheaf—has returned disappointed.

According to J. R. Kennamer, the president of the Alabama mineworkers comprising district No. 20, nothing could be done in Washington. Dr. H. A. Garfield, the coal administrator, and the President of the United States were absent from their offices and Secretary of Labor Wilson was too sick to attend to business.

The committeemen intend to return to Washington as soon as John P. White calls them, which may be before long if a readjustment is made in the central competitive region. The mineworkers are expected to remain at work in accord with the resolutions made by their representatives in a recent convention.

Some comfort is felt at the return of many of those negroes who earlier in the war deserted the mines for the North. It is estimated that 1500 men have returned. James L. Davidson, the secretary of the Alabama Coal Operators' Association, states that he has seen as many as 20 letters in which the writers are asking for transportation back home for themselves and their friends.

Jellico Region Is Still on Strike

The contest being waged between the mine owners and mine workers of southeastern Kentucky and eastern Tennessee, has again been marked by violence, once more to be charged against the strikers. This violence is reported from Harlan, where eight employees of the Wilson Berger Co., while riding to work in a motor car on the morning of Sept. 27, were fired on from ambush. Unknown persons of uncertain number concealed behind trees and bushes fired 25 shots. One man of the mine workers' party was dangerously wounded, shot through the shoulder. No arrests have been made. On the same day a special grand jury at Harlan returned 60 indictments charging as many miners with banding together for unlawful purposes. One hundred miners, notified to appear, marched into the court on the day before, accompanied by 200 others. Many of the defendants brought clothing with them and it was indicated that if indicted they would decline to make bond and would submit themselves to the custody of the county officials to be cared for while they awaited trial.

The operators decline to state what they expect the outcome will be, but indicate that they expect the Government will direct the settlement. Miners on strike are generally reported to be ready to work, while union leaders and organizers are holding them together without much sign of a break. It is rumored that this strike to establish the union has already cost 20 lives.

It is reported that a tentative agreement between the mine workers' and coal operators' subcommittees was reached Oct. 1 and that a special convention of the mineworkers was called for Thursday, Oct. 4, to accept or reject the agreement. The new contract called for large increases in wage. There is probably some truth in this statement, but the operators referred to are men of small capital and the mines they run employ few men.

* * *

Miners employed in the Fern Hill Coal Co. mine in Daviess County, near Owensboro, Ky., have been granted the union scale—an increase of 8c. per ton. The operation is the largest local mining operation in a part where the mines are quite generally small. However, the unionization is a sign of the present drift in western Kentucky and our correspondent says it foreshadows other similar developments in that region.

* * *

In Ohio the miners are extremely wrath that they are charged with collusion with the operators. They are particularly incensed at Atlee Pomerene, one of the state senators, and at Governor Cox. Pomerene has been active in seeking lower coal prices. President William Roy, of Subdistrict No. 5, says that "Very suddenly the authorities have begun to worry about what the public will pay. Do they realize that, in the past, coal has been sold so cheaply at the mines that the operator was compelled to lose acres of coal because he was not able to pay an extra price for mining certain parts of the bed?"

Editorials

THE second Liberty Loan, to the extent of three billions of dollars, is now calling insistently on our patriotism. The Secretary of the Treasury says that he will accept subscriptions to that amount and may further take one-half the amount subscribed above the three billions. That is, if five billion dollars is subscribed as is expected, four billion of that may be accepted by the Treasury.

* * *

The smallest sum we are expected to raise—$3,000,000,000—means about $30 per person, or $150 per family. The larger sum—$5,000,000,000—calls for $50 from each person, or $250 from every family. It is no little saving that is required of all of us if these sums are to be raised. As it will be followed shortly by other loans, we should not deceive ourselves by thinking that we have several months or years in which to meet the demand made of us.

* * *

The first loan was too largely subscribed on the *long* installment plan by people who did not realize what demands inevitably confronted them. One instance is recalled where a Liberty Bond holder has after several months paid one-half on his $50 loan and borrowed $25 on the score of that investment. So he has not saved anything at all. He has had all the thrill of patriotism without doing anything for his country. The loan is not made till the money is saved, and most of us have not resigned ourselves to the demands which the loan is making upon us.

* * *

THE soldier is going to make his sacrifices. The rule of the army will see to that. When he puts on the uniform he knows what that action means. When he cuts himself adrift and goes "over there," he realizes he must meet privation. But we civilians have no uniforms; we have not cut ourselves adrift from the living comforts of our homes, and we are doing just what we did before the war. It is the old story. Without a new garb and a new environment, a new life is almost impossible. We cannot resign ourselves to sacrifices that were not formerly demanded of us. So the war remains to us only an aspiration, not a fact.

* * *

Not that much is being asked of us. We are not called upon by the Government to buy stocks, the profits of which are problematical and kept down at best during the war to a meager figure; we are not asked to invest in securities that will have but little value after the war. No one is demanding that we risk our money in anything perilous, such as by buying railroad stocks and bonds to reëstablish the transportation business of this country. No one is asking us to invest our money in that way. We fear it would be too big a strain on our patriotism to ask us for our money and tell us that the security is risky, the profits limited by a dictator, and that after the war our money will be practically taken away from us. Besides, we do not want the stigma of being munition makers. It is true that on reflection we know that munition making during a war is the most honorable of work "behind the lines." But the pro-German press and platform has preached its lies to us so persistently that we have a sneaking desire to keep away from this most worthy of occupations.

* * *

AS FAR as profit is concerned, the Liberty Loan has none of these drawbacks. It is a regular "war baby." It will pay its 4 per cent. regularly until it is changed for a loan paying more. Its market price will be steadier under the strain than that of other bonds, and far steadier than any stocks. Stocks during the present year have shrunk in value more than they have paid in dividends, while the 3½ per cent. Liberty Loan has never been below 99 and now is sold around par. After the war it will certainly rise to a premium. It is sure to pay its 4 per cent., and it will unquestionably be redeemed 100 cents on the dollar by Uncle Sam.

* * *

The purchase of Liberty Bonds is the safest, most conservative kind of a deal, and what is more, it is one with dignity attaching to it. It is an honor to have as many Liberty Bonds as our incomes will permit; while apparently it is doubtful honesty to hold the bond of a munitions company, though the war could not be conducted without investments in both. Our point of view is terribly distorted, but nevertheless if you want profit and honor you select both when you purchase Liberty Bonds.

* * *

Since Liberty Bonds are a desirable investment and a certificate of good citizenship, the only question you will have to settle is whether you so desire the defeat of autocracy, murder, false faith, robbery and arson that for these objects you will save your money and forego your luxuries. If you have made savings, or feel you can make them, the bonds will be bought; for they are a good investment. The difficulty is not to induce you to buy, but to convince you that you must save; that the country in a moment of peril demands that you become fruitful, producing more than is sown. Too often, like poor seed wheat which does not yield any more than is planted, we have been content to balance income and outgo without any attempt to save.

* * *

WHEN America first entered the war it was thought that the profits of industry would be left to run at random and that the wealthy by their munificent profits would be able to finance the war. But the President and Congress decided to arrange it otherwise. They lowered prices, and in doing so inevitably put the matter of the support of the war largely on the shoulders of the workingmen. That is a democratic thing to do and the right idea—if the workingman is ready to recognize his responsibility and take up the bulk of the

loan. It seems settled that he must not be asked to pay special taxes. It is certain, therefore, that he must lend a large part of that fund which the needs of the Government absolutely demand.

* * *

The wage earner must be careful, and we all must be careful, lest we permit ourselves to believe that we can be more prosperous during the war. The struggle cannot be won that way. Do you think that we can put aside $250 a family throughout this land between now and Jan. 15, 1918, when the loan must all be paid, unless we tighten our belts and part almost entirely with our old luxurious ways, unless as Lincoln said "we give our last full measure of devotion" to our country?

* * *

We have seen a lot of cities of sheds rise in the land, sheds such as no man would build for his humblest workmen to dwell in. The soldiers are to be housed in these rude encampments. They know it is the best we can give them in our extremity. In the sublimity of their patriotism they go to them to endure. It is a small sacrifice they realize compared with what they will make when they get to France, where the Germans have made horrors and privations men's daily food. But they are willing to suffer this and more than this for the greatest boon of man—liberty. Are we, because we are still untorn from our homes, because we are still drawing the sap of comfort from ancient roots to protest that we have no part in this world's sacrifice and no share in its sorrow? A little thing this saving for Liberty Bonds—a little thing indeed. Let us see that the doing of it is not beyond the capacity of our untried manhood!

A Standing Invitation

NO ONE man has a monopoly of knowledge on any particular subject; and no industry is so large and self-contained that it can afford to move along in the same old paths from day to day without lending an ear to the advice of the workers within it—the men who confront and master the difficulties of the day's work.

As with any other calling, the art of mining is so hard to learn, and life itself is so short, that true progress is only to be attained by an interchange of ideas and experiences. Everyone in the industry must learn, everyone in the industry must teach; for only in this manner can the mistakes of one be turned to the advantage of another, or the success of one be made the success of all in the industry.

Coal Age has ever been to the fore in furthering this spirit by its standing invitation to readers of the paper to become contributors. Time after time the value of this principle has been demonstrated, and now it can with certainty be said that *Coal Age* is a technical journal of, by and for its readers.

All the pages in all the departments of the paper are open to contributors, and every page—from the Foreword to the news items covering local doings in the industry—affords an outlet for the experiences, ideas and inspirations of every one of its readers. Aside from the prestige that accrues to one who writes, and the knowledge that the industry is ever gaining by the dissemination of information pertaining to it, is the by no means unimportant fact that *Coal Age* pays for such writing—the extent to which one can add to his regular income being dependent only on the energy and application of the contributor.

Our Coal Productive Capacity

WE RATE the present activity of our mines at about 80 per cent. because that percentage of the larger mines is working; but we pay little or no attention to the smaller mines which have been closed down. We overlook the fact that only a few of the mines have enough men to enable them to attain a full capacity when all are working, and we forget that a large number of men are absentees even when the mine runs. In fact, this is becoming more and more frequent with rising wages. On the whole, it is doubtful if our mines are running at 50 per cent. capacity despite the reassuring statistics received.

It has been found in West Virginia that the closing of the grog shops has worked a wonderful reformation, but there is still, even there, much to be accomplished. It is to be hoped that during the war, at least, the miner may be induced to forget those habits of intermittent idleness which years of unsteady work have taught him, and that he will work daily, and full time every day, being urged on to that industry by a batch of Liberty Bonds calling insistently for payment.

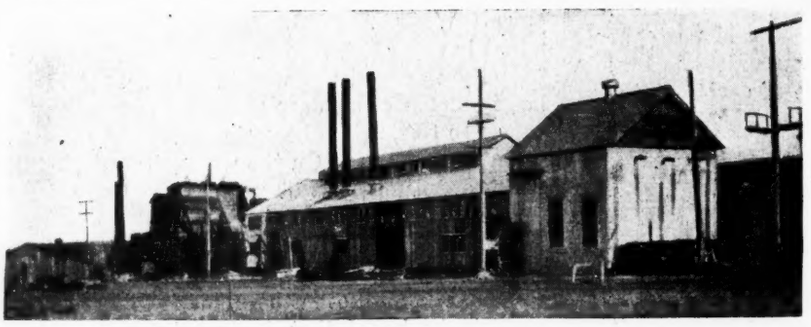
Give the Increase to Liberty Loan

AN INCREASE of 10c. per ton, 20 per cent. for dead-work and yardage and $1.50 per day for daymen, means roughly about $150,000,000 a year, and late reports show that this may be granted to the mine worker if the Government will permit a countervailing increase in price. It is a well established fact that the man at the mines is making a good living. He can well afford to expend every cent of the wage increase in Liberty Bonds and he may well give far more than that.

It has been hard to keep the miner steadily at work at past wages, which shows that the stories of hard times due to increased prices are not true. The cost of living has advanced considerably, but the steadier work offered, the greater facilities granted by which the worker can earn all the time he is in the mine and the higher rate of pay have discounted the increased cost of living and made the lot of the mine worker more happy than ever. He could well afford to play the honorable part of bondholder without any increased wage, and with it the capacity to be a bloated capitalist is brighter than ever. Every one will wish him luck if he strives to turn the tables and be a creditor instead of a debtor. It is to be hoped he will do this instead of learning with the increment of wage new extravagancies and follies which will hamper him severely when times become normal and work becomes less steady.

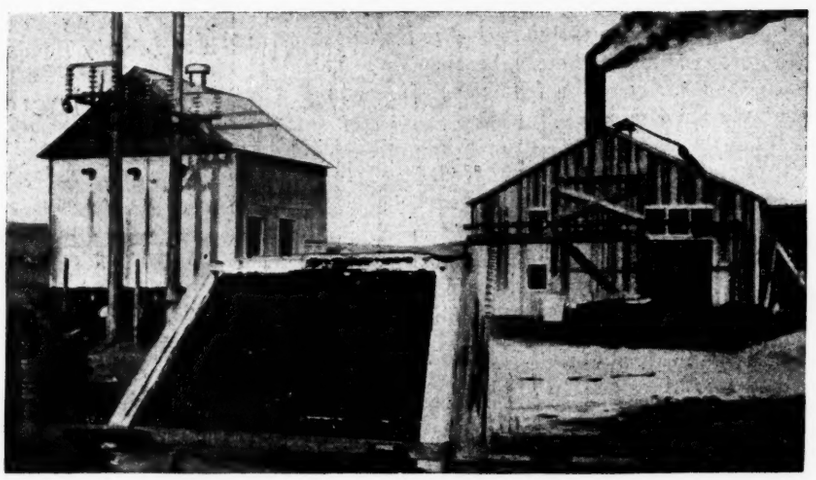
Let every mine worker prepare to pay to the loan as much as this increased wage amounts to. And in his loyalty to the Government let the operator be a close second. Closeness in expenditure is needed also from him. Let him beware of ostentation in his public life, and waste and lavishness in his private expenditures. The coal industry should pay into the national exchequer in loans at least a half billion a year.

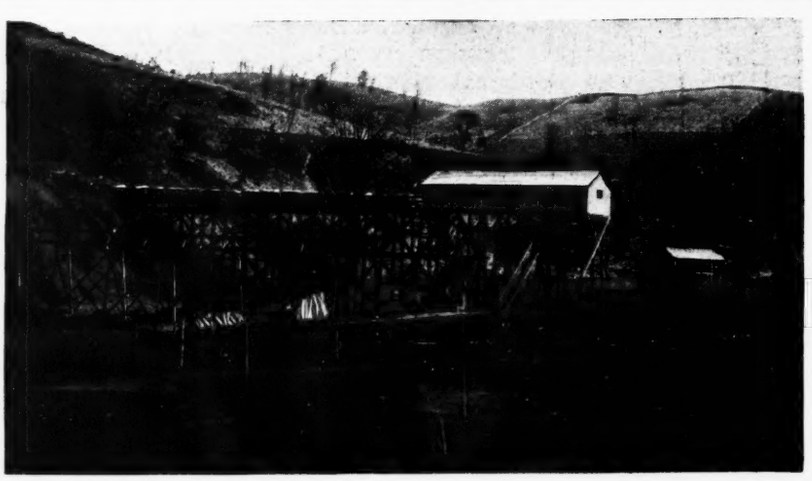
Snapshots in Coal Mining



SURFACE PLANT OF THE COTTONWOOD COAL CO., LEHIGH, MONTANA

AIRSHAFT AND TRANSFORMER BUILDING, COTTONWOOD COAL CO., LEHIGH, MONTANA





JOHN A. CLARK'S COAL TIPPLE AT COONSRUN, MARIAN COUNTY, WEST VIRGINIA

Discussion by Readers

The Fireboss in Colorado

Letter No. 1—The inquiry that appeared in *Coal Age*, Sept. 1, p. 385, relative to the employment of firebosses in Colorado, gave an instance of a man who was employed to act as fireboss in a portion of a mine that generated no gas, having been granted permission to act in that capacity until the next examination. At the examination, however, he failed to secure the first-class mine foreman's certificate, which he desired, but was granted an assistant mine foreman's certificate in a nongaseous mine.

The inquiry stated that, on request, the board gave him permission to continue to act as fireboss in the mine in which he was then employed, which was his right as holding an assistant mine foreman's certificate. The question was raised whether this permission to act as fireboss in the mine where he was employed authorized him to act as fireboss in a portion of that mine generating gas.

To my mind, the failure of this man to pass the required safety-lamp tests and to state correctly the nature and behavior of the different gases found in mines proves beyond a doubt that he was not capable of performing the duties of a fireboss in a mine generating gas. It is this knowledge of safety lamps and mine gases that the Board of Examiners, in Colorado, claims a man must possess before he can receive a certificate making him eligible to act as fireboss in a mine generating gas.

Certified Firebosses Required in Colorado

In replying to this inquiry, the editor apparently overlooked sec. 171 of the Coal Mining Laws of Colorado, which reads as follows: "From and after Jan. 1, 1914, it shall be unlawful for any owner of any mine to employ any coal mine examiner, shotfirer, mine foreman, assistant mine foreman, or fireboss who does not possess a certificate of competency from the Board of Examiners, except as provided in this act."

The Colorado Mining Laws have been in force since 1913, when they underwent a thorough revision. A few of the sections have been amended since that time. Since Mar. 1, 1916, all coal mines in Colorado must be examined by a certified fireboss or other certified person eligible to act as fireboss.

By the amendment of sec. 80, only a certified mine official can act as fireboss in a mine generating gas. A first-class mine foreman or a first-class assistant mine foreman is authorized to act as fireboss in a mine generating gas, while a second-class mine foreman or second-class assistant foreman can only act as fireboss in a nongaseous mine.

All coal mines in Colorado are considered nongaseous until they are found to generate explosive gas in sufficient quantity to be detected on an approved safety lamp. It is my opinion that no person should be allowed to act as fireboss in any mine—gaseous or nongaseous—unless he has a first-class mine foreman's certificate or holds a fireboss' certificate. I would have no second-class certificates of any kind. I think that the office of assistant mine foreman might well be abolished and the office of safety inspector take its place, for which a first-class certificate should be required.

All fireboss certificates in Colorado read as follows: "This is to certify that John Doe has passed a satisfactory examination and is capable to act as fireboss in any mine in the State of Colorado."

The second-class certificate issued to mine foremen or assistant mine foremen permits the holder to act as fireboss in a nongaseous mine. The certificate reads as follows: "This is to certify that John Doe has passed a satisfactory examination to act as mine foreman [assistant mine foreman] in mines not generating explosive gas."

Robert A. Marshall.

Farr, Colo.

The Pennsylvania Mining Law

Letter No. 1—In line with the discussion relating to the employment of uncertified mine foremen, I am impressed with the thought that one of the best features of the Pennsylvania mining law—both anthracite and bituminous—was eliminated when, in considering the question of workmen's compensation, the state legislature passed and the governor approved acts 329 and 330, legalizing the employment, by coal operators, of mine foremen and assistant foremen who held no certificates but whom the operator considered as competent as certified men to perform the duties of the office.

Act 329 applies to the anthracite law and act 330 to the bituminous law. The particular feature of each of these acts, to which I refer, is the amending of those clauses of the old law that required the employment of certified men to act as mine foremen and assistant foremen.

Art. 8, sec. 1, of the anthracite law reads as follows: "It shall not be lawful, neither shall it be permitted for any person or persons to act as mine foremen or assistant mine foremen of any coal mine or colliery, unless they are registered as a holder of a certificate of qualification or service under this act."

As amended, this section is made to read the same as the above, with the addition of the following words: "*or, unless, in the judgment of the employer, he is a person possessed of qualifications which make him equally competent to act in such position.*"

In art. 8, sec. 6, relating to the operation of a mine, for a period of 30 days, "without *such certified* mine foremen," the amended law strikes out the words "such certified."

Act 330 applies to the bituminous law. Here, also, the old law relating to mines "generating explosive gas in quantities sufficient to be detected by an approved

safety lamp," required that "the mine foreman must possess a first-grade mine foreman's certificate," while in nongaseous mines the law required that "the mine foreman must possess either a first-grade mine foreman's certificate or a second-grade mine foreman's certificate."

In this reference, the amended law reads: "If the mine is generating explosive gas, . . . the mine foreman must possess a first-grade mine foreman's certificate, *or be a person who, in the judgment of the operator, is a person equally competent with the holders of such certificates.* If the mine is nongaseous, the mine foreman must possess either a first-grade mine foreman's certificate or a second-grade mine foreman's certificate, *or be a person who, in the judgment of the operator, is a person equally competent with the holders of such certificates.*"

Statistics Show Necessity for Certification

Regarding these changes in the law, I have said that the best features of the law were eliminated by these amendments. My opinion is based on the belief that the more technical knowledge a mining man possesses, the better he is fitted to superintend mining work. The truth of this statement seems fully corroborated by the statistics of accidents that appear each year in the reports of the mine inspectors.

For example, an examination of the mining reports for the years 1871 to 1884 inclusive, which was previous to the time when the employment of certificated mine foremen was required by law, shows that there was a greater number of fatalities, per thousand men employed, in that period than later when the law requiring the certification of mine foremen and assistant foremen went into effect.

It must be remembered, also, that mining conditions have changed, and the danger of fatal accidents has greatly increased in later years, owing to a number of causes such as the installation of mechanical equipment and the employment of a larger proportion of foreign labor in the mines, to say nothing of the vastly extended development of the workings.

Early Operation of Certificate Law Hampered

That the law requiring the certification of mine officials has not been given a fair trial until recently will be generally admitted, because it is well known that the standard of examination for a number of years was quite low, and certificated men were not required to possess the technical knowledge of mining that is necessary at the present time. It may also be assumed that examining boards were not as strict in their requirements as they are now.

As a result of this laxity in the examination of candidates, certificates were formerly granted to men who would not be considered competent today. These conditions, it must be admitted, would detract from the benefits to be derived from the certification law. But, notwithstanding these drawbacks, it is clear that the law has been of great benefit in the protection of life and property. A comparison of fatal statistics in states where there is no certification law will also serve to show the benefit of such a law.

In closing, permit me to express the belief that the examination and certification of candidates for the positions of mine foreman, assistant foreman or fireboss is absolutely necessary to insure a maximum of safety in the working of coal mines. To be effective this examination must be conducted without friendship or favoritism and by the state alone. A company cannot be considered as competent to conduct the examination of its own men without prejudice.

Permit me to add that anyone who will claim that the certification law has not reduced the number of accidents in and about the mines is either not informed of the facts or has some selfish purpose in view. It is my belief and that of others that the Pennsylvania mining law *will never be complete until this requirement of the old law is replaced and made effective.*

Kingston, Penn. MINE FOREMAN.

Mine-Car Friction

Letter No. 2—Referring to the letter of Graham Bright, *Coal Age*, Sept. 8, p. 424, where he comments upon the advantages of equipping mine cars with roller bearings, allow me to say that he seems to view the situation from one standpoint only—that of saving power.

It seems a pity that in his article, which is meritorious in many respects, Mr. Bright has not considered the question of roller bearings for mine cars on a broader basis. His statements are very general and do not discriminate between the different types of roller bearings that are in use in mine haulage. While many of these types have not proved as successful under the severe conditions to which they are subjected in the mine, it can be said that the type known as "flexible roller bearings" have given satisfaction wherever they have been introduced.

Valuable Feature of Flexible Roller Bearings

It has been my experience to have observed, in many instances, the advantages gained in the equipment of mine cars with this particular type of bearing. One point that I have learned, in talking with mine superintendents who have used flexible roller bearings, is that these bearings maintain nearly the same low frictional resistance, after being in use several months, as they possessed when first installed. The flexibility of the bearing is an admirable feature, in this respect, as it reduces the jar and diminishes the wear and tear whereby the life of the bearing is greatly prolonged.

In speaking of the saving of power, Mr. Bright is no doubt right in stating that the saving is much greater where the tracks in the mine are level. However, those who have followed the mining game for a number of years know that the actual conditions on mine haulage roads are quite different from what Mr. Bright here assumes; and if the saving of power was the only advantage to be derived from the use of roller bearings, the change from the old sleeve bearing would not be so general as is the case in the mines today.

While admitting that the saving of power, in mine haulage, is a vital feature in favor of roller-bearing equipment, allow me to draw attention to another advantage that rivals, if it does not eclipse, the power-saving feature of a properly designed bearing, such as the flexible type to which I have referred.

Having been employed in mines where the cars are equipped with both plain sleeve bearings and roller

bearings, I can say with truth that the saving of power is a minor consideration in comparison with the greater saving realized in lubrication charges, which include not only the cost of the oil, but the labor of oiling the cars. The latter is no small item in the proper lubrication of the old type of plain sleeve bearings. The monthly cost-sheet makes this saving very apparent and it is one that does not require the mine management to make special tests to demonstrate, as it is a dollars-and-cents proposition that is plainly in evidence.

Every practical mining man knows that mine cars equipped with plain sleeve bearings require constant lubrication, involving a liberal use of oil, much of which finds its way to the tracks and ties, instead of being utilized in lubricating the car bearings.

Lubrication Cost Greatly Reduced

In the use of properly designed roller bearings, such as the flexible type, the car wheels need to be lubricated only once in from three to six months. In the interval between successive oilings of the wheels, the cars run with equal ease, provided a good grade of lubricant is employed.

There is still another feature that is of advantage in the use of a good roller bearing, and one which Mr. Bright has not mentioned; namely, cars equipped with these bearings have a much lower initial starting torque than those equipped with plain bearings. As a consequence, the wear and tear on the mine motors and on the cars is much reduced, resulting in a reduction in the repair charges for locomotives and cars. This is also a feature manifest in the monthly cost-sheet. It should be remembered that there is, besides, an increased efficiency developed in the miners when the cars they must handle are more easily moved.

Uniontown, Penn. W. Jay Kay.

Qualified Mine Foremen

Letter No. 1—A qualified mine foreman is one who, when trouble arises, knows how to overcome the difficulty in an intelligent manner. The trouble may be a physical one requiring a knowledge of the principles of mining, or it may arise from a difference with the men. In the latter case, the foreman must manifest a cool and firm attitude, while treating his men in a gentlemanly way that cannot fail to command their respect. In dealing with trouble, the foreman should always have due regard to the future and devise a scheme that will avoid the same trouble at another time.

A qualified foreman is a man of good understanding—one whose long experience will enable him to give good counsel in matters relating to the work in his charge. First and foremost in his mind is the safety of his men, as he realizes fully that men cannot perform the work they should when they are exposed to unsafe conditions.

When contemplating new work, the qualified foreman will study well the conditions before making a move. As a skillful checker player is a careful student of the game, and the successful general informs himself of every feature of the attack, so the qualified foreman acquaints himself with all the conditions surrounding the work before making a start.

In the operation of a mine, there is probably no more important feature of the work than that of removing pillars. The qualified foreman has had this in mind from the time work was commenced at the bottom of the shaft or slope. His experience has taught him that it is absolutely necessary to leave ample supports for the protection of all main roads, as well as substantial pillars along outcrop lines. The removal of pillars is begun by starting, as far as practicable, from the inby end of the workings and proceeding on the retreating plan.

One of the greatest mistakes in mining is the dangerous practice of "skipping" off the pillars, which greatly reduces the needed support and is prone to develop a squeeze. A foreman that will permit such a practice is not qualified for his position, as the usual result is a large loss of coal that can never be recovered; and, in some instances, lives are sacrificed.

One of the strongest evidences of a qualified foreman is the habit of preparing for the future, whereby much trouble and expense are saved. T. J. Aston,
Superintendent, Temple Coal Co.

Letter No. 2—I am writing because I think it almost a calamity that men of supposed ability should express themselves as opposed to the requirement of better educated mine foremen. This is an age of specialization. Men in all branches of industry are required to know one thing and know it well. The "jack of all trades" has gone, and the "master of one" is here and will remain.

The man in charge of work, today, must know its requirements and be able to demonstrate his knowledge. As well might we try to stop the flow of Niagara as to attempt to arrest the demand for the better education of industrial workers. The distinguishing feature of man is his power to reason. A parrot can be taught to articulate words and repeat what he hears: the monkey, the dog and the horse can each be trained to perform certain acts, but it remains for the red-blooded human to find out things and apply them.

In reading some of the letters that have appeared in *Coal Age*, I have been impressed with the thought that the writers regard too lightly the responsibilities that rest on a mine foreman. They appear to disregard the fact that he is the guardian of life and property. Upon his intelligence depend the welfare, health and safety of the men in his charge.

Uncertified Men Not Qualified Foremen

For one, I fail to see what benefit can obtain from lowering the requirements for the education and technical knowledge of mine officials, as indicated by the suggestion that uncertified men who possess practical knowledge only are as well qualified to fill an official position in a mine as the certified man who, besides his practical experience, has acquired a knowledge of the theory and principles of mining.

As well may it be argued that the clerk, who has gained his experience in transcribing court proceedings, is qualified to practice law; or that the experienced nurse is qualified to practice medicine and perform the duties of a certified physician.

The qualified mine foreman, as I see him, is a man that stands preëminently above his men—mentally and morally. His moral character is particularly important in maintaining the respect and control of his men, among whom he must have a reputation for straight-

forward, honorable dealing. He must be a leader, a thinker and a student of both human nature and of mining. His example and influence must be such as to uplift his men and give them higher standards of living.

The remark that I heard a foreman make in reference to one of his men who was studying to improve himself showed plainly that the foreman's standard was inferior to that of the man whom he characterized by saying, "He thinks he is smart." It was a remark inspired by jealousy; and, in my opinion, that foreman was not qualified for the position he was holding, his one weak point being a contempt for learning.

Constant Study and Reading Help To Qualify Men

It is hard for me to understand how any man working around a pump or an engine, or handling the ventilation of a mine, can keep from reading and studying things that will give him a better knowledge of his work. By so doing, he will be preparing himself to pass an examination that will fit him for the duties of fireboss, assistant foreman or foreman of a mine.

Some years ago, I asked the foreman of a mine where I was working what was the difference between pressure and power, in mine ventilation. His reply was, "I'll be d— if I know; I forgot all that stuff after I had passed the examination." Let me remark that such a man is not qualified for the position he holds, because he does not apply in daily practice the knowledge he gained in studying for his certificate.

Revised Pennsylvania Law Severely but Justly Criticised

I believe thoroughly in the certification of mine officials by examination. In my opinion, Pennsylvania will not be likely to permit the law, enacted two years ago, to remain long on her statute books. By that law, an uncertified man who is considered by his employer as competent as one who holds a certificate can be employed as foreman or assistant foreman of a mine.

It is needless to say that such a provision opposes and renders useless those sections of the same law providing for the examination and certification of mine officials, and is a disgrace to the law-making body of the state. It has made the mining law of Pennsylvania the laughing stock of other states, and cannot long endure.

In closing, let me refer to the request that is often made, by practical miners, for a plan that will enable them to gain the theoretical knowledge that will qualify them for an official position. I want to suggest the following: Read *Coal Age* from cover to cover and study more carefully those parts that are of interest to you. If you have charge of an engine or a pump, get its dimensions. Learn to calculate the area of the cylinder, the piston displacement and the discharge of the pump; also the power required to operate the engine or to discharge the required amount of water under the actual lift.

If you need help to work out these questions, write to the Inquiry Department of *Coal Age*, or get someone at home to assist you. In the same manner, find the dimensions and speed of the fan and calculate the quantity of air discharged under a given water gage. These and other like problems in practice will greatly interest you and will quickly fit you for a higher position.

Masontown, Penn. J. O. Durkee.

Oil-Shale Mining in Scotland

Letter No. 1—The reference to the oil-shale industry of Scotland, by J. L. Brown, *Coal Age*, Sept. 8, p. 401, interested me, as I worked in the mines of that country some forty years ago.

The first mine in which I was employed was at West Calder, in Midlothian. The shaft was called No. 10 and was worked on the longwall advancing system. Later, I was employed in several of the shafts in that vicinity, and my recollection is that they were practically all worked on the same system.

In some of these mines the seam was undercut with longwall machines, as the shale was underlaid with a soft rash that was easily mined. There was also 18 in. of a bastard shale, which was used for building packwalls. Roadways were maintained about 80 ft. apart. The cars were small, holding only from 1000 to 1200 pounds.

Owing to the pitch of the seam, all the shafts were sunk at the lowest point on the property, and crossheadings were driven on water level and the seam worked to the rise of these levels. In some of the mines the cars were lowered from the face to the level by rope and pulley, while in others chutes were employed on the inclines.

Mr. Brown states that "there is only a small quantity of marsh gas given off, and there is seldom an explosion of firedamp." My experience in these mines is quite different from that. In one shaft where I worked, which was located near the town of West Calder, the coal lay 600 ft. below the surface and the mine was hot with gas. I remember being in three explosions in that district. Considerable damage was done by these explosions and some lives were lost. This seam dips to the east and outcrops to the west, and wherever a drillhole was sunk gas was found.

Mr. Brown also states that the shale was, at times, undercut with shots. I never knew this method to be employed, as the undercutting was always made either by machines or with picks, in the soft rash beneath the shale. After cutting about 18 in. deep, the miners would snub the shale down with a wedge and hammer.

The Broxburn seam is worked about 10 miles from West Calder. I was employed there some time. The main slope was driven to the dip of the seam and rooms turned off from the slope in a manner that resembled the panel system. The cars were somewhat larger in this mine, holding about 1500 pounds.

The air was split at the bottom of the slope, half of the current going to each side of the mine. As the rooms were turned on the strike of the seam, crosscuts were driven to the rise through the 50-ft. pillars separating the rooms. The rooms were driven 18 ft. wide and a track laid along the lower rib. The rash cut from beneath the seam was used to ballast the track. A wing brattice was run along the upper rib to conduct the air to the face of each room, as the places made much gas. There was little water and the mine was quite dry.

In working this seam, a hole was bored with a ratchet drill on each rib. The shots placed in these holes were generally sufficient to bring down the shale, but sometimes three holes would be required. The average thickness of this seam was 6 ft. The miners made good

wages and were generally contented, there being no strikes or lockouts.

It will be of interest to know that it was in these mines that "sunshine" was first discovered. It came about by the boys attempting to use tallow in their lamps when out of oil. The lamps, however, burned dim as the heat was not sufficient to melt the tallow; but, by filing off about 1 in. of the spout of the lamp, good results were obtained.

It happened one day that the mine manager (foreman), observing the lamps, inquired why the spouts were cut off so low. The result was that he investigated a little by himself and a few months later brought into the mine a lamp having two spouts, a copper spout inside of the tin spout. The lamp burned tallow. The copper spout, being a good conductor of heat, served to keep the tallow melted, and the lamp gave a good light. This, I believe, was the beginning of the use of sunshine in miners' lamps. The idea quickly spread all over Great Britain. ROBERT GIBSON.

Maylene, Ala.

Wagon Mines vs. Patriotism

Letter No. 3—The subject of this discussion seems to be a worthy one, at the present time, when every patriotic American is anxious to do his bit to aid in the prosecution of the world war. The operation of that class of mines known as "wagon mines" presents many different phases for consideration.

Assume, for sake of illustration, that a certain farm is underlaid with coal, the seam outcropping in a hillside where formerly a good drift opening had been reached by a railroad switch. For some reason, the operation of this drift mine was abandoned some years ago and the switch torn up. Now, the owner of the farm, actuated by patriotism as well as personal gain, determines to use the small capital that he has accumulated by hard labor and laid aside for a time of need and reopen the drift and start mining coal.

The application made to the railroad company to relay the old switch so as to afford the needed shipping facilities meets with disappointment, and the owner of the mine is forced to employ teams to transport his coal from the mine to the railroad station, where it is loaded on the cars and shipped. The work of reopening the mine and developing the working face proceeds satisfactorily, and a few cars of coal are mined and shipped, for which the owner realizes some little profit, as the market prices are good.

Shortly, however, this small operation is again doomed to disappointment when the Government takes a hand and fixes the price of coal mined and sold in the market. The price fixed by the Government is so low that it is a practical impossibility for this mine to continue operations. The limited equipment and the expense of transporting the coal from the mine to the station admit of no profit to the owner, and the work must cease.

Now, considered from a patriotic standpoint, is there anything that can be done to relieve the situation and enable this coal to be mined? The case that I have assumed is not an unusual one, and the question arises, Is this coal to be lost to the owner and to the commonwealth, and the nation deprived of this source of supply, by reason of the fact that the market price fixed by the Government is too low to cover the expense of its extraction and marketing?

It is true the coal may not be of as good quality as that mined in other localities and the expense of operation may be prohibitive. However, I am of the opinion that something can and should be done to make these isolated patches of coal available. Does not the law of coördination of natural resources and supplies apply to these outlying operations? R. W. LIGHTBURN.

West Leisenring, Penn.

Old-Type Pumping Engines

Letter No. 1—Being an Englishman and having been employed as an engineer to operate engines of the same kind as that described in the article that appeared in *Coal Age*, July 14, p. 49, I was much interested in the description there given. I beg to offer a few additional remarks on the engines of that time.

The writer of the article to which I have referred states that "steam could be best condensed by injecting water into the cylinder." I think this is a mistake and that the water should be injected into the condenser; at least that was the practice at the time when I was employed running such engines, in the North of England, County of Durham.

I have hoisted coal from a shaft 1600 ft. deep with an engine of this type. It was in the year 1881, when I was employed as hoisting engineer at Morton colliery, County of Durham. The cylinder of my engine was 5 or 6 ft. in diameter and 8 or 10 ft. long. The engine made ten strokes a minute. These engines were all four-valve engines, except those of the Cornish type, which worked both on high and low pressure, on the same cylinder, and were three-valve engines.

The blowoff pressure for the boiler that furnished steam to the engine was 15 lb. The boiler was 35 ft. long. Although there is no record of one of these boilers ever blowing up, it was a common occurrence in those days when cleaning a boiler to accidentally punch a hole in the side of the shell with a hammer, which would be an unheard-of thing in present-day practice.

The hoisting drum was what was known as a "horn drum." At the beginning of the hoist it had a diameter of 16 ft. Flat wire rope was used, which was 4½ in. wide and wound upon itself, so that the diameter of winding when the hoist was completed was 18 feet.

One incident that I recall happened on a Sunday morning. Two mine foremen were in the mine, and the engine that should have been used to hoist them was broken and could not be used. The master mechanic came over and asked me if I thought I had enough steam up to hoist the men. I replied that I did not know, but would try. Although I found but 2 or 3 lb. of steam on the boiler at the time, I concluded to make the hoist and, setting the cage on the bottom, at the given signal hoisted the men to the surface.

When the thing was done I found that the steam pressure had dropped to zero, as indicated by the gage on the boiler. This cage was arranged to hoist four tubs at a time, one above the other on the cage, each tub weighing when loaded 1400 lb. I thought these incidents would be of interest in this connection.

Ellsworth, Penn. WILLIAM WATSON.

Inquiries of General Interest

Salaries of Mine Officials

It would be both interesting and instructive if *Coal Age* would publish a statement showing the average salaries paid mine officials in the different coal-producing states. The information would show the relative importance in which the work of inspection and superintendence of mines is held in different mining districts; or, in other words, it would show the value that the several states and the coal companies operating therein place upon the service rendered by mine inspectors and mine officials. In the same connection, I would like to ask for what information is available in regard to the certification of mine officials. STATISTICIAN.

Washington, D. C.

The salaries paid incumbents of like official positions, in the different coal-mining states, cannot be taken as a true index of the value of the services rendered, owing to the wide variation in conditions that must be met and difficulties surmounted. The conditions may require men of wider experience and greater knowledge and intelligence in one state than in another; or the same may be true in different districts of the same state.

However, believing that the question is one of interest, and instructive to a degree, *Coal Age* has endeavored to secure reliable information of the salaries paid mine officials in the different coal-producing states. It must not be supposed that a mine foreman drawing a salary of, say $80 or $100 a month in one state can expect to secure a position that will pay him a salary of twice that amount in another state. It should be remembered that the more difficult conditions in the latter state require greater capability and wider experience, which naturally command higher pay. Salaries are also governed by local living conditions. The isolation of the district, house rents and price of food and other necessities are factors that influence salaries.

The figures given below represent the average salaries paid for the positions named, in the states that have responded to our request for this information:

ALABAMA—Chief mine inspector, $3000 per annum; associate mine inspectors, $2000 per annum; mine superintendents, $150-$250 per month; mine foremen, $100-$185 per month; assistant mine foremen, $90-$135 per month; firebosses, $80-$110 per month; shotfirers, $90-$100 per month; safety inspectors not generally employed; hoisting engineers, $80-$110 per month; track and timbermen, $90-$100 per month; drivers and daymen, $60-$90 per month.

ARIZONA—State mine inspector, $3000 per annum; deputy mine inspectors, $1800 per annum. No coal mines operating at present. Work of inspectors confined to metal mines.

ARKANSAS—State inspector of mines, $2000 per annum. No report submitted in respect to salaries of mine officials.

CALIFORNIA—Chief mine inspector, $3300 per annum; deputy mine inspectors, $2700 per annum. No coal mines operating at present. Work of inspection confined to the metal mines.

COLORADO—Chief inspector of coal mines, $4000 per annum; deputy inspectors, $2700 per annum; mine superintendents, $140-$225 per month; mine foremen, $100-$155 per month; assistant mine foremen, $100-$135 per month; firebosses, $100-$142 per month; shotlighters, $4.60 per day; trackmen, timbermen, drivers and daymen, $3.94-$4.15 per day.

IDAHO—State inspector of mines, $200 per month. Only one small coal mine operating. Duties of inspector chiefly metal-mine inspection.

ILLINOIS—Director of the Department of Mines and Minerals, $5000 per annum; assistant director, $3000 per annum; mine superintendents, $150-$400 per month; mine managers (foremen), $125-$200 per month; assistant mine managers, $100-$135 per month; mine examiners (firebosses), $4.14 per day; shotfirers, $5.55 per day; hoisting engineers, $102.57-$123 per month; trackmen, timbermen, drivers and daymen, $3.60 per day; and all other inside day labor, $3.35, except trappers, whose scale is $1.90 per day; outside labor, $2.96; miners examining board, $1800 per annum and expenses; state mining board, $500 per annum and expenses; six mine-rescue superintendents, $125 per month.

INDIANA—State mine inspector, $2000 per annum; deputy mine inspectors, $1500 per annum; mine superintendents, $150-$250 per month; mine bosses (foremen), $125-$150 per month; assistant mine bosses, $100-$125 per month; firebosses, $100-$120 per month; shotfirers, $5-$7 per day; hoisting engineers, $105-$116 per month; trackmen, timbermen, drivers and daymen, $3.60 per day.

IOWA—Mine inspectors, $1800 per annum; mine superintendents, $125-$150 per month; mine foremen, $80-$150 per month; assistant mine foremen, $75-$125 per month; shotfirers and safety inspectors, $4.54 per day; hoisting engineers, $80-$100 per month; trackmen, timbermen, drivers and daymen, $3.58 per day.

KANSAS—State mine inspector, $125 per month; deputy mine inspectors, $100 per month; mine foremen, $125 per month.

KENTUCKY—Chief inspector of mines, $1800 per annum; assistant inspectors, $1500 per annum; mine foremen, $100-$150 per month.

MARYLAND—No report submitted.

MICHIGAN—Inspector of coal mines, $1200 per annum; mine superintendents, $145 per month; mine foremen, $110 per month; assistant mine foremen, $100 per month; trackmen, timbermen, drivers and daymen, $3.60 per day.

MISSOURI—Chief mine inspector, $2000 per annum; assistant mine inspectors, $1800 per annum; mine superintendents, $175 per month; mine foremen, $125 per month; assistant mine foremen, $100 per month; firebosses, shotfirers, safety inspectors, hoisting engineers, $4.11 per day; trackmen, timbermen, drivers and daymen, $3.60 per day.

MONTANA—State coal mine inspector, $2500 per annum; mine superintendents, $200-$300 per month; mine foremen, $125-$175 per month; assistant mine foremen, $125-$140 per month; firebosses, $4.70 per day; shotfirers, $3.94 per day; hoisting engineers, $4.20 per day; trackmen and timbermen, $3.99 per day; drivers, $3.78; team drivers, $3.94 per day; inside labor not classified in agreement, $3.57 per day.

NEW MEXICO—State mine inspector, $2000 per annum; mine superintendents, $150-$225 per month; mine foremen, $115-$175 per month; firebosses, $135 per month; shotfirers, $4.25 per day; safety inspectors, $150-$175 per month; hoistmen, 50c. per hour; trackmen and timbermen, 50c. per hour; drivers, 49½c. per hour; pumpmen, pipemen, sprinklers, rockmen and wiremen, 48⅛c. per hour, per agreement.

NORTH DAKOTA—State engineer—ex-officio state mine inspector, $2500; deputy state mine inspector, $1800.

OHIO—Chief deputy and safety commissioner of mines, $3000 per annum; mine inspectors, $1800 per annum; mine superintendents, $125-$250 per month; mine foremen, $110-$175 per month.

OKLAHOMA—Chief mine inspector, $3000 per annum; assistant mine inspectors, $1500 per annum; mine superintendents and foremen are paid on a tonnage basis, averaging from $2500 to $3000 per year; firebosses, $4.149 per day; shotfirers, $4.107 per day; company mine examiners, $4.15 per day; hoisting engineers, $120 per month; trackmen and drivers, $3.60 per day; other inside labor, $4.10 per day.

PENNSYLVANIA—Chief of Department of Mines, $5000 per annum; deputy, $3500 per annum; chief clerk, $2400 per annum.

Anthracite—Mine inspectors, $3500 per annum; general superintendents, $500 per month and up; outside mine superintendents, $210-$220 per month; inside mine superintendents, $175 per month; mine foremen, $125-$150 per month; assistant mine foremen, $110 per month; firebosses, $95-$100 per month; trackmen and timbermen, $2.80 per day; drivers and daymen, $2.40 per day. It is not uncommon for miners in the anthracite field to make $50 per week mining coal, while the average earning of the anthracite miner is about $3 per day.

Bituminous—Mine inspectors, $3500; general superintendents, $200-$500 per month; outside superintendents, $100-$125 per month; mine superintendents, $150-$225 per month; mine foremen, $75-$200 per month; assistant mine foremen, $100-$150 per month; firebosses, $5-$8 per day; shotfirers, $4-$6 per day; trackmen and timbermen, about $4 per day; other labor, $3-$4 per day. Miners in the bituminous field earn from $5 to $17 per day.

SOUTH DAKOTA—State mine inspector, $1600 per annum.

TENNESSEE—Chief mine inspector, $3000 per annum; district mine inspectors, $2000 per annum; statistician, $2000 per annum.

TEXAS—State inspector of mines, $2000 per annum.

Bituminous—Mine superintendents, $150 to $250 per month; mine foremen, $75 to $150 per month; assistant foremen, $50 to $100 per month; hoisting engineers, $125 to $150 per month; trackmen, timbermen and drivers, $3.83 per day. No firebosses, shotfirers or mine examiners employed.

Lignite—Mine superintendents, $100-$150 per month; mine foremen, $50-$100 per month; assistant foremen, $50-$75 per month; hoisting engineers, $75-$100 per month; trackmen, timbermen and drivers, $2-$2.50 per day. No firebosses, shotfirers or mine examiners are employed.

UTAH—State mine inspector, $2000 per annum; mine superintendents, $230-$240 per month; mine foremen, $160 per month; outside foremen, $120 per month; firebosses, $4.40 per day; shotfirers and inspectors, $4.40 per day; company mine inspectors, $195 per month; hoisting engineers, $125 per month; trackmen, timbermen, drivers and daymen, $4 per day; other labor, $3-$4.80 per day, as per wage scale.

VIRGINIA—Mine inspector, $1400 per annum; mine superintendents, $210 per month; mine foremen, $135 per month; assistant mine foremen, $100 per month; firebosses, $100 per month; shotlighters, $3 per day; company mine examiners or safety inspectors, $100 per month; hoisting engineers, $65 per month; trackmen, $3 per day; timbermen, $2.75 per day; drivers, $2.35 per day; other daymen, $1.90 per day.

WASHINGTON—State mine inspector, $3000 per annum; deputy inspector, $2400 per annum; mine superintendents, $200-$300 per month; mine foremen, $150-$180 per month; assistant foremen, firebosses and shotlighters, $4.75-$5 per day; hoisting engineers, $4.25 per day; trackmen and timbermen, $4.49 per day; drivers, $4 per day; other labor, $2.05-$4.30 per day, per supplementary agreement, June 7, 1917.

WEST VIRGINIA—Chief of Department of Mines, $3000 per annum; district mine inspectors, $2100 per annum; mine superintendents, $200-$400 per month; mine foremen, $80-$225 per month; assistant mine foremen, $3-$3.50 per day; firebosses, $90-$125 per month; company mine examiners, $125-$250 per month; hoisting engineers, $90-$100 per month; trackmen and timbermen, $3-$3.60 per day; drivers, $2.75-$3.60 per day; daymen, $2.85-$3.50 per day.

WYOMING—State inspectors of coal mines, $2000 per annum; mine superintendents, $225 per month; mine foremen, $165 per month; assistant mine foremen, $127 per month; shotfirers and inspectors, $4.40 per day; hoisting engineers, $120 per month, pro rata for overtime exceeding 8 hours per day; trackmen, timbermen and drivers, $4.02 per day; inside labor not classified, $3.88 per day; other labor, $2-$4.40, as per new wage scale, May 7, 1917.

A Mine Dam

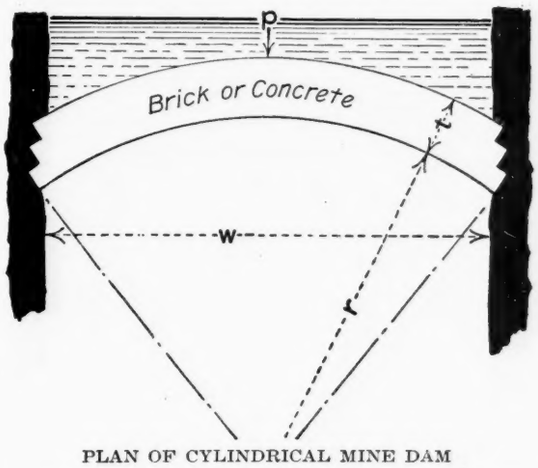
We have had a lttle controversy in regard to the thickness of a brick dam required to withstand a pressure due to a head of 100 ft. of water. The dam is cylindrical and built in an entry 9 ft. wide and 7 ft. high, in the Pittsburgh seam of coal. We have agreed to submit this question to *Coal Age*, and ask for the proper method of calculating the thickness of the dam. What quantity of water will flow through two 6-in. pipes built in this dam, assuming that the head producing the flow is 100 ft., as stated. MINING ENGINEER.

Greensburg, Penn.

Assuming that the dam is built into solid ribs of coal that have been cut so that the bearing surfaces of the brick masonry will be radial, as shown in the accompanying figure, the thickness of the dam may be calculated by the following formula:

$$t = \frac{3pw\sqrt{4r-1}}{S_c}$$

in which t is the thickness of the dam, in inches: p the pressure due to the head of water, expressed in pounds



PLAN OF CYLINDRICAL MINE DAM

per square inch; w the width of opening, in feet; r the radius of the inner concave surface of the dam, in inches; and S_c the compressive strength of the material, in pounds per square inch.

The pressure due to a 100-ft. head of water is $100 \times 0.434 = 43.4$ lb. per sq.in. The width of opening, in this case, is $w = 9$ ft. The radius of the concave surface of the dam should never be less than the width of the opening and may be half again as great. In this case, we will assume a radius of $r = 12$ ft. (144 in.). The compressive strength of good brick masonry laid in portland cement may be taken as 600 lb. per sq.in., in mine work.

Substituting these values in the above formula gives for the required thickness of the dam

$$t = \frac{3 \times 43.4 \times 9\sqrt{4 \times 144 - 1}}{600} = 46.8 \text{ in., say } 4 \text{ ft.}$$

The flow of water under a head of 100 ft., through two 6-in. pipes 4 ft. in length can be estimated, approximately, by the method and formula explained in *Coal Age*, Vol. 11, p. 848, which is as follows:

$$G = 20d^2\sqrt{\frac{2dh}{3.12d+l}} = 2(20 \times 6^2)\sqrt{\frac{2 \times 6 \times 100}{3.12 \times 6 + 4}}$$
$$= \text{say } 10{,}000 \text{ gal. per min.}$$

Examination Questions

First Examination in Washington, Held Under the New Law

(*First-Class Questions*)

Ques. 4—On the regular mine map the distance measured from the top rib of an entry to the low rib of the airway above is 3.95 in., the measure being taken on a pitch of 60 deg. What distance would you drive rooms off the lower entry and leave a 30-ft. barrier pillar below the airway?

Ans.—Assuming the mine map is a plan or horizontal projection drawn to a scale of 100 ft. per inch, as required by the Washington Coal Mining Laws, a length of 3.95 in. measured on the map corresponds to 395 ft. of horizontal distance in the mine. The corresponding slope measurement on a pitch of 60 deg. is 395 ÷ cos 60 deg. = 395 ÷ 0.5 = 790 ft. In order to leave a barrier pillar of 30 ft. measured on the slope, the distance the rooms should be driven up the pitch is 790 — 30 = 760 feet.

Ques. 5—State your views on the causes and prevention of the following accidents: (a) Injuries from falls of rock or coal. (b) Injuries from mine cars or haulage. (c) Injuries from shots.

Ans.—(a) Accidents due to the fall of rock or coal are caused chiefly by the neglect of miners to stand the necessary timbers at the face when required and to sprag the coal as it is mined. Another cause is the neglect to examine the roof carefully and detect the presence of slips, in the formation, and loose pieces of slate that requre timbering. The way to avoid these accidents is to set all timbers promptly where a close examination of the roof shows that they are needed. The coal should be well spragged as it is mined.

(b) Injuries caused by the movement of cars in rooms and on the haulage roads are due chiefly to the neglect of employees to observe the proper precautions to avoid accident. No one should be permitted to travel on the main-haulage roads, in a mine, unless there is provided a proper clearance on one side of the road to enable the cars to be passed with safety. This class of accidents is often caused by the roads and rolling stock not being maintained in good condition, on which account cars are frequently derailed.

To avoid these accidents, strict regulations should be enforced in regard to the movement of cars on slopes and inclines. No cars should be permitted to stand on the track where they will obstruct haulage, or be left on a grade without being sufficiently blocked to avoid their running out on the main road. Separate travelingways should be provided for the men to travel to and from their work, or there should be a good clearance on one side of the track, on all haulage roads.

(c) Accidents in blasting are numerous. They are chiefly caused by miners returning to the face to ascertain why a shot has failed to explode; or to ascertain the result of a shot, going back before the smoke has sufficiently cleared to enable them to observe any danger that may be present. Many accidents occur from overcharging a hole, or failing to properly mine a shot. A misplaced shot may also cause accident by blowing its tamping. Accidents occur from using too short a fuse, or biting off the match of a squib, or dipping it in oil to make it burn quicker. Other accidents are caused by mixing different grades of powders in the same hole, or attempting to fire several shots at the same time, in a single heading.

Accidents from blasting are best avoided by the employment of competent shotfirers, who shall inspect all holes and charge and fire all shots, after the men have left the mine. When this is not done, the mine foreman and his assistants should carefully inspect the work done by each miner, and give needed instructions to the men in regard to blasting, and see that all regulations and instructions are strictly obeyed.

Ques. 6—If the quantity of air passing in a mine is 120,000 cu.ft. per min., under a water gage of 1 in., what is the horsepower producing ventilation?

Ans.—The horsepower producing this circulation is calculated as follows:

$$H = \frac{Q(5.2 \times w.g.)}{33{,}000} = \frac{120{,}000 \times 5.2 \times 1}{33{,}000} = 18.9+ \ hp.$$

Ques. 8—In order to double the quantity of air in a mine, in what proportion must the ventilating pressure be increased?

Ans.—To double the quantity of air circulating in a mine will require four times the ventilating pressure, since the pressure varies as the square of the quantity of air in circulation, other conditions being the same.

Ques. 9—What are your views in regard to using mixed lights in a gaseous mine? State in full the reasons for your approval or objection to mixed lights.

Ans.—To insure safety, mixed lights should never be used in a mine generating gas. The chief reason for this restriction is that if open lights are allowed in any portion of a mine requiring the use of safety lamps in one or more sections of the mine, there is no guarantee that some one will not carelessly enter the safety-lamp section with an open light on his head, forgetful or unmindful of its presence. Again, it is possible that a heavy fall of roof may occur in the safety-lamp section and drive the gas out of that section onto the airways where it may come in contact with open lights.

Again, the presence of gas in one section of a mine makes it possible that gas will, sooner or later, make its appearance in other sections. This may occur suddenly and without warning, owing to a disturbance of the strata caused by the extraction of the coal. These possibilities make it wholly unsafe to work a mine with mixed lights. Either the circulation in a mine should be so increased that open lights can be used with safety in those places generating gas, or the entire mine should be worked exclusively with safety lamps.

Coal and Coke News

For the Busy Reader

Liberty Bonds! Enough said.

* * *

Two new seams of coal were found in the southern Illinois coal fields below the present Nos. 1 and 2 veins.

* * *

State of Ohio proposes that penitentiary convicts be put to work in the mines to relieve the labor shortage.

* * *

Operators in Kentucky and Tennessee appeal to Interstate Commerce Commission for more cars in order to supply South with more coal.

* * *

The Government rate increase allowed by the Interstate Commerce Commission upon the transportation of coal interstate and intrastate is now in effect.

* * *

About 80,000 tons of coal are mined daily between Pittsburgh, Penn., and Fairmont, W. Va., and 45 per cent. of this is shipped via the Monongahela River.

* * *

Two men were killed in Harlan, Ky., when a posse headed by County Judge Ward engaged in a pitched battle with a crowd of striking mine workers.

* * *

Effective Oct. 1, 1917, retail dealers may charge 30 per cent. above 1915 margins. Special provisions were made for price-fixing by dealers who were not in business in 1915.

* * *

Bituminous producers are now getting out about 72 per cent. of what would be a full time output. The chief reasons for the restricted production are shortage of labor and inadequate car supply.

* * *

Fuel administrators have been named for many of the states. They are to reccommend administrators for each city and town, and these will fix local prices and distribute coal through local dealers.

* * *

The strike in the southeastern Kentucky field has reduced a normal daily production of about 30,000 tons to perhaps 1500 or 2000 tons, and it is reported that many mine workers are leaving the field.

* * *

As the United States Steel Corporation has granted its 200,000 employees a 10 per cent. increase of wages on Oct. 1, it is presumed the Frick coke workers, and eventually the whole region, will receive a similar advance.

* * *

Low water in Schuylkil River hits coal washeries in Pennsylvania. Even water pumped from the mines for coal washing is decreasing, owing to the fact that there have been only two brief periods of rain in the Pottsville region during September.

* * *

According to the latest estimate, the United States produces 531,619,487 short tons of coal a year, which is about 40 per cent. of all the coal mined around the globe, or nearly as much as Great Britain and Germany together, and one-third more than all of Europe.

* * *

The latest official figures of the movement of coal by 72 roads traversing the bituminous fields of the country show that the August total was but slightly larger than in July or in the corresponding month last year, when demand was less, and that shipments of coke were actually smaller.

* * *

Wagon loaders heard from Garfield that to sell coal at $2 at the mines and then charge for hauling would be a violation of the President's orders, unless the coal was sold directly to the consumer and not through a commission man or broker for reseiling. Many small operators have shut down their plants.

Harrisburgh, Penn.

With the price of coke fixed by the Government at $6 a ton and a wage advance of 10 per cent. going into effect at all the coke plants in the Connellsville region on Oct. 1, a further coal shortage appears certain. The coal situation in the western part of the state could hardly be worse, especially in the coke regions.

It is figured that there will be a further exodus of miners from the Virginias when the new coke-region wage scale goes into effect. An advance in wages to hold the miners in these states is said to be out of the question.

Many of the coal operators are in the dumps. Joyful tidings from Washington to the effect that the Government decided coke, iron and steel prices after conferences with the producers only served to remind the coal operators that they, too, tried this plan, and that they not only agreed to a slashing reduction of coal prices, but put that reduction into effect before the Government's price-fixing bill was enacted. They further point out that the price they agreed upon—$3 a ton at the mines—is much lower, proportionately, than the $6 a ton allowed for coke. Accepting the customary methods of cost determination. $6 coke is the equivalent of coal at $3.50 to $3.75.

Independent coke producers are not particularly cheerful over the coming wage advance announced by the United States Steel Corporation. This advance will extend to the H. C. Frick Coke Co., which dominates the coke region. Owing to the fact that the Frick company sells no coke, shipping its product to Steel Corporation furnaces, it will not be as seriously affected as the independents. Few of the independents, however, aside from some of the smaller corporations, will be seriously hit. Coke contracts have ranged around $8.50 a ton, and the bulk of the tonnage goes on contract. An even greater percentage of coke is sold on contracts in normal times than coal.

Observers of the coal trade predict that the investigations into contracts now being made by the Fuel Administration, if pursued closely, will have the further effect of curtailing coal tonnage. Quite a number of wagon loaders are still in business and it is an open secret that they are not living up to the $2 price. They are within the law in that they charge $2 at the mine and are allowed prices ranging from 90c. to $1.50 for hauling coal and loading it on cars. An expected ruling from Washington as to the propriety of this method may put an end to the practice of these operators.

In the Pittsburgh district the situation is further complicated by the growing natural gas problem. The natural gas companies have served notice to the manufacturing plants and the large buildings that gas will be discontinued to them after Nov. 1, the gas companies conserving the supply for private consumption. This throws back on the already demoralized coal market an enormous want that they have never felt before.

The country is facing a situation in the soft coal industry that threatens to slow down the war machinery, to stop many of the wheels of industry and to menace the comfort of the people the coming winter. Bituminous operators here state that it is impossible for them to prevent a coal shortage this winter, and that an increase in the Government price is the only thing that would stave off complete chaos in the industry. They contend that the demands of the miners for a 60 or 70 per cent. increase in wages for day workers and 25 per cent. increase for tonnage workers could not be granted under the Government's prices.

Small mines in this state are closing down in great numbers because of the sheer impossibility of their continuing operations at a loss. In the Pittsburgh district, operators from that section asserted, fully 70 per cent. of the 50 so-called wagon mines in Allegheny, Fayette and Westmoreland Counties have shut down. These mines, with the small mines in central Pennsylvania, produce about 50,000 tons a day.

The operators say that the car supply of course, enters seriously into the question, and it is declared that, even if a higher price is granted, drastic action by the Priority Board to switch cars used for other purposes into coal carrying exclusively will be essential to an adequate supply for this winter.

Conditions are not good in the anthracite field. Statistics show that all the collieries are undermanned, it being estimated that fully 25 per cent. of the men formerly employed around the mines have left in the last three years, either to obtain employment in the munition factories at higher wages or enter the army, nearly 10,000 Italian reservists having left for the war.

PENNSYLVANIA

Anthracite

Parsons—Realizing that much coal was being stolen from loaded gondolas in the switches, Delaware & Hudson Coal Co. officials set a trap for the guilty ones and rounded up 40, all of whom were taken before a local justice of the peace where they pleaded guilty and paid the fine imposed. So much of value has been taken from the coal company's property in the last few months that officials found it necessary to issue a blanket order prohibiting all persons, whether an employee or not, from taking even a piece of firewood.

Mt. Carmel—Henry Waters, outside foreman at the Natalie colliery, was found in a senseless condition in the breaker structure recently. One of the foreman's legs had been torn away after he had fallen into the machinery. He was internally injured and will likely die.

Scranton—About 500 requests for exemption of men in their service have been filed with the appeal board of the middle judicial exemption district by the Delaware, Lackawanna & Western and Delaware & Hudson Coal companies. The board expects to reach the exemption claims of the coal counties before the middle of October.

Pittston—If the enthusiastic spirit that marked the opening meeting of the board of directors of the Pittston District Mining Institute may be accepted as a criterion, the fall and winter season of the institute is going to be quite as successful as past seasons. Regular meetings of the institute are to be held monthly and arrangements are being made for many programs that will be helpful to the members. Seward Button, of Wyoming, superintendent of the Mt. Lookout Coal Co., has been elected president of the organization for the ensuing year.

Nanticoke—In order not to close down all their collieries on one day and thus curtail the output of coal, the Susquehanna Collieries Co. and the Lytle Coal Co. have abandoned their first-aid contest day, and will hold their eighth annual first-aid contest this year separately at each division point.

Pottsville—One of the officials of the Buck Run Coal Co. made the statement that the Buck Run breaker, which was recently burned to the ground, will be put into operation some time during October.

Hazleton—The Lehigh Valley Coal Co. has granted the use of some of its land here for use as a rifle range by the Hazleton Government Rifle Club.

The Lehigh Coal and Navigation Co. is importing negroes from the subway contracts in New York for work in and about its local mines and collieries through the Panther Creek Valley. This is due to the present shortage of labor owing to wartime conditions.

The Lehigh Valley Coal Co. is making every effort to increase the production of coal before winter sets in. The company has exceeded the record for the first eight months of 1916 by more than 1,000,000 tons, and it is anticipated to break all records for the completed year.

Effective Oct. 1, the Lehigh Valley Coal Co. will commence the shipment of coal to four of the sixteen National Army canton-

ments. The orders provide that the first cars loaded at every mine in the morning are to go to the camps in preference to any local or other order to be filled.

Reading—Fire, Sept. 28, destroyed a portion of the coal yards of Isaiah B. Seibert, with loss estimated at $10,000.

Shamokin—In a terrific explosion of gas recently at the Susquehanna Coal Co.'s Richards colliery, five men were badly burnt, two probably may not recover.

Mauch Chunk—Attorney Redmond, of Hartford, Conn., was here recently to arrange for bringing suit against the Lehigh Coal and Navigation Co. in behalf of John Herman, of Coaldale, who was closed in the Foster tunnel for six days two years ago. It is alleged that Mr. Herman is a physical wreck as a result of his experience.

Bituminous

Pittsburgh—The Inland Coal Co., a subsidiary of the Inland Steel Co., is constructing a large coal mine plant at Indianola, Allegheny County, on the Bessemer & Lake Erie R.R. All buildings will be fireproof and the mine and town will be up to date in all respects.

The largest schedule of assets and liabilities in the history of the United States Court in this district was filed recently by Josiah V. Thompson, former coal king of Uniontown, Penn., in his involuntary bankruptcy petition. The total liabilities are $39,368,098.11 and the assets are $57,474,593.71.

Keenan—The Anandale Coal Co., of Erie, has awarded a contract for the erection of 10 one-story houses at its Keenan station on the Hilliard branch of the Bessemer road. The company expects to commence mining coal at its plant here shortly.

Clearfield—Howard D. Pfeiffer, of the Chaffee Coal Co., with others, has purchased the mines of the Dolly Coal Co., in Clearfield County.

Practically all operators in this section have received letters from the Government requesting information on the cost of production prior and up to Sept. 1 of this year. The data are requested for the years 1915, 1916 and 1917. No change will be made in the coal prices until this information is in the hands of the Fuel Administration.

West Pittsburgh—The Garland Corporation is proceeding with its new coal mine. The incline is now under construction and the company expects to have coal out in a few months.

Washington—J. M. Patterson, of Carnegie, recently purchased 6000 acres of coal land in Donegal township, 10 miles north of here, for the J. H. Hillman interests, of Pittsburgh, for $1,000,000. Immediate development has been announced, with a railroad spur probably to be built from Washington.

The Lilley Coal and Coke Co., of Pittsburgh, purchased 4000 acres of coal lands adjoining Washington on the east for $1,250,000 and will soon start to sink a shaft.

In order to fill the great and pressing need for coal in the Northwestern States, Fuel Administrator Garfield on Oct. 1 ordered that until further notice no more coal be shipped from Great Lakes ports into Canada.

Somerset—Licensed liquor dealers of Somerset County and representatives of fraternal and social organizations were informed by Judge W. H. Ruppel recently that the sale of liquor to miners in clubs, if it incapacitates the miner for work next day, is unlawful, and prosecutions would be made in the case of such sales.

Greensburg—David P. Hudson has transferred his holdings in Unity and Derry townships to the Greensburg-Eastern Coal Co., of Greensburg. The tract comprises 49 acres of Pittsburgh seam coal and was purchased recently by Mr. Hudson for slightly exceeding $100,000. The Greensburg-Eastern company will begin operations soon.

WEST VIRGINIA

Wellsburg—The West Virginia-Pittsburgh Coal Co. recently purchased 606 acres of coal land opposite this city from the John McKim heirs. The price was $175 an acre. The company now owns 5000 acres of coal across the river as well as the Lewis Findley mines at Colliers, the Gilchrist mines at Cross Creek, and La Belle, below this city.

Huntington—A report emanating from Williamson is to the effect that the United Thacker Coal Co. sold its vast coal and timber holdings in Mingo and Logan Counties. The filing and recording in the office of the county clerk of Mingo of a satisfaction and release of a mortgage held against the property by the Guaranty Trust Co. of New York, is responsible for this report, it is said.

KENTUCKY

Louisville—A special Federal Grand Jury is in session at Louisville where the cases of numerous persons charged with charges of conspiracy against the United States, of one kind or another, are being investigated. There are thirty-three cases growing out of the clash at the Diamond mine, near Clay, Ky., in Webster County, between strikers and a body of Kentucky National Guards in Federal service. They are accused of opposing by force the authority of the United States Government. One additional arrest has been made.

Jenkins—More coal is now being mined in the Jenkins-Fleming-McRoberts-Haymond fields than at any time in the history of the development of this field. The railroads are doing everything possible to furnish cars.

Benhams—Approximately $3,000,000 is the amount which the United States Coal and Coke Co. of Gary, will invest for its Harlan and Letcher county coal development in Kentucky. Plans call for the development of 20,000 acres of coal land to a daily capacity of 10,000 tons of coal, all the mechanical equipment to be driven by electric power. The town development is to cost $1,900,000.

Barboursville—The United States Coal and Coke Co., a subsidiary of the Steel Corporation, is assembling a vast force of workmen in Harlan County, near the Virginia border, where preliminary operations in the development of 30,000 acres of coking coal territory are starting. The center of development is about one mile from Benham, the mining town of the International Harvester Co., on the Black Mountain extension of the Louisville & Nashville Railroad.

Hazard—The Algonda Block Coal Co., recently organized at Lothair, is making extensive improvements and additions in its local plant.

OHIO

Cincinnati—According to Mayor Puchta, the city's coal requirements to Apr. 1, 1918, are 1,470,844 tons. At present the coal on hand is less than a six-days' supply for the entire city.

Dayton—The coal scarcity became so serious here recently that Governor Cox seized a train bearing 1000 tons of coal and sent it to this city. The seizure may be used as a test as to whether Ohio is to suffer while its coal was being shipped away under orders from the Federal Priority Shipping Board.

Mifflin—Storage at the mines of the Whitaker-Glessner Co. is being tried. The coal is mined for the use of the Portsmouth steel mills principally and will be loaded for shipment with derrick and grab bucket when cars are available.

Columbus—Of 21 cities that have replied to a recent query of the state coal clearing house as to the amount of coal available, only three—Canton, Ballaire and Coshocton—have enough on hand to last through the winter. Some municipalities report no coal can be obtained at any price.

ILLINOIS

Springfield—Workmen engaged in laying the concrete base for the statue of Abraham Lincoln, which is to be erected at the Capitol Ave. entrance to the State House grounds, discovered a vein of coal at a depth of 15 ft. State officials were notified, but the laying of the base proceeded. Early settlers say that coal was discovered on the capitol site more than half a century ago, but was not developed because of the close proximity of a creek which would have made mining operations dangerous.

Murphysboro—Two new veins of coal have been struck in the southern Illinois field below the bed rock on which the present Nos. 1 and 2 veins lie. One of the seams runs from 3 to 4½ ft. at a depth of 180 ft. at Mt. Carbon and lies under a roof of sandstone and shale which is 14 to 16 ft. thick.

Carlinville—A coal vein has been struck at a depth of 319 ft. in the new Mine No. 4 of the Superior Coal Co. at Wilson. The first load of coal from the mine will be sold at public auction and the proceeds will be given to the Red Cross fund. The mine will employ between 800 and 1000 men. The output is expected to be 7000 tons per day. The town of Wilson was built by the Superior company and was incorporated during the last presidential election. The Superior company operates three other mines in this vicinity, all of which are of large capacity.

Bryant—John Long, of this place, announces plans for opening up, a mile and a half west of here, one of the largest slope mines in the state. It will have entries on either side of a small valley. The Burlington railroad will run a track to the mine.

Mt. Carmel—Saline County Mine No. 3 broke all county records by hoisting a total of 40,444 tons in 14 days.

Duquoin—Joe Leiter, creator of the town of Zeigler, south of here, and who for years had a monopoly of the coal mining industry there, is about to dispose of all his remaining holdings in this county, it is reported. The Bell and Zoller interests of Chicago have operated the mine for several years, but Leiter still has extensive real estate holdings. In the early days of Zeigler, Leiter was the central figure of the biggest labor war that this section has ever experienced.

Belleville—The State Miners' Examining Board will be here Oct. 8. The itinerary for the rest of the month will be: Staunton, Oct. 9; Springfield, Oct. 10 and 11; Pana, Oct. 12; Danville, Oct. 13; Cole City, Oct. 16; Spring Valley, Oct. 22; Peoria, Oct. 23; Macomb, Oct. 24.

IOWA

Madrid—Work on the new mine the Scandia Coal Co. is sinking just south of the city limits is progressing satisfactorily. Shifts work through the 24 hours and the sinking of the shaft is progressing slowly but steadily. The shaft has been sunk to a depth of about 75 feet.

MISSOURI

St. Louis—It has been learned that W. D. Waugh, special agent for the Federal Trade Commission at Washington, has been here since Sept. 18 in a suite of offices at the Maryland Hotel investigating the coal situation. He says he is here to keep an eye on the general situation and carry out any orders he may receive from the Fuel Administration at Washington. The city, he says, is in the midst of such a large distributing center and has so many industries that it was felt necessary to have a representative here to take care of complaints and other matters that could not be so well taken care of through correspondence.

Attorney-General McAllister, before departing for Washington, in obedience to a telegram from Fuel Administrator Garfield, said that as soon as possible after his return he will file anti-trust proceedings against several big coal companies as a result of the recent investigations at Kansas City and here, and will ask the Supreme Court to fine them a sum equal to the excess profits which he alleges they have got this year. The Attorney-General took with him to Washington a voluminous, record of the inquiry in this state. He says he has found that the average cost of production in Missouri is about $1.90 a ton, while in Illinois it is not above $1.25 a ton.

Foreign News

Vancouver, B. C.—The Chamber of Mines is being moved from the Molsons Bank Building to the second floor of the Old Dominion Building, at the corner of Hastings and Cambie Sts., where it will have pleasanter and more commodious quarters.

Personals

Samuel A. Taylor, consulting mining engineer, of Pittsburgh, Penn., has been called to Washington to serve on the staff of Fuel Administrator Garfield.

Samuel P. Kennedy, president of the Public Service Commission of Alabama, has been named by Dr. Garfield as Fuel Administrator for the State of Alabama.

R. B. Woodworth has been appointed advertising manager and sales statistician of the Carnegie Steel Co., with offices in the Carnegie Building, Pittsburgh, Penn.

F. M. Rodgers, formerly connected with the Blue Gem Coal Co. at Harlan, Ky., has accepted the position as mine foreman for the Four Seams Colliery Co. Glendean, Kentucky.

M. L. O'Neale, formerly with the Bird Coal and Iron Co., of Talladega, Ala., has accepted the superintendency of the Connellsville Basin Coke Corporation, Morgantown, W. Va. He assumed charge of his new position on Oct. 1.

John J. James, connected with the engineering department of the Philadelphia & Reading Coal and Iron Co., Pottsville, Penn., for some years past, has resigned to become associated with the Merrill Engineering Co., Beckley, West Virginia.

George Conway, resident engineer of the Utah Fuel Co., in the Scofield district, has received a commission as second lieutenant in the United States Army. Mr. Conway is a graduate of Lehigh and former member of the Penn National Guard.

John E. Woods, formerly manager of sales of the Carnegie Steel Co., Illinois Steel Co. and the Tennessee Coal, Iron and Railroad Co., at Cincinnati, Ohio, has been appointed assistant general manager of sales of the Carnegie Steel Co., with offices in the Carnegie Building, Pittsburgh, Penn.

Rembrandt Peale, president of Peale, Peacock & Kerr, Inc., Winburne, Penn., and widely known as the head of other coal operations in central Pennsylvania, has resigned his connections with these companies to take up his work as bituminous coal advisor to Dr. Harry Garfield, at Washington, D. C.

Marian Whidden, who has been superintendent of the social service department of the Tennessee Coal, Iron and Railroad Co. for seven years past, has resigned to accept a similar position with the Nova Scotia Steel and Coal Co., at Glasgow, N. S. She will be succeeded by Winifred Collins, of Chicago.

Frank Carter, formerly of the Estes-Jellico Coal Co., Pleasant View, Ky., has been promoted to manager and superintendent of the Whitley-Elkhorn Coal Co. at Sergent, Ky. Mr. Carter is well known to the coal trade generally in Kentucky, and his promotion will be hailed with delight by his legion of friends.

Edward Stauverman, formerly with the Atlanta office of the Worthington Pump and Machinery Corporation, will have charge of the company's new branch sales offices in the American Trust and Savings Bank Building, Birmingham, Ala. This new office has been established with a view of rendering better service to the trade.

Cadwallader Evans, superintendent of mines of the Delaware & Hudson Co., has resigned his position, to accept the general managership of the International Salt Co., with headquarters at Retsof, N. Y. Mr. Evans has been with the Delaware & Hudson Co. for the last two years and is considered one of the best mining men in the anthracite region.

Kyran Donahue was recently appointed as mine inspector for the State Workmen's Insurance fund by Governor Brumbaugh. Mr. Donahue was formerly a mine inspector in the 18th anthracite district, but was defeated last autumn on the Democratic ticket due to the fact that his opponents were on two tickets. His field will be in the lower anthracite region.

Thomas Reese, formerly superintendent at the Park Place colliery, of Pottsville, Penn., has been sent to Washington as representative of the coal consumers of Pottsville, who are taking this means of protesting against the recent raise in the price of pea coal. Mr. Reese has many years experience as a mining man and goes to Washington well equipped for the task.

Obituary

Royal Canfield Peabody, president of the Combustion Engineering Corporation, 30 Church St., New York City, died on Sept. 15.

William S. Connor, aged 58, prominent in the coal trade and former director of public safety in Columbus, Ohio, died recently in that city.

Harry Taylor, aged 80, for nearly 40 years paymaster for the Lehigh & Wilkes-Barre Coal Co., on the Honeybrook Division, is dead. He was a Civil War veteran.

Sterling S. Lanier, president of the Monroe-Warrier Coal and Coke Co., the Norton Mining Co. and the Riverside Coal and Coke Co., died in Birmingham, Ala., on Sept. 25. The deceased was 57 years of age. He is survived by his widow and six children.

Eli Huston, of Dawson, W. Va., died recently, aged 82. For ten years he was superintendent of the Fort Hill mine of W. J. Ramey. Before going to Fort Hill he assisted in opening the Leisenring No. 1 mine of the H. C. Frick Coal Co., being its first superintendent. Mr. Huston had lived a retired life since 1887.

Industrial News

St. Louis, Mo.—The name of the West Virginia Coal Co. has been changed to the West Virginia Coal Co. of Missouri.

York, Penn.—The Block Elk Coal Mining Co. has been incorporated with a capital of $100,000 to mine coal. R. S. Cannon is treasurer of the company.

Elm Grove, W. Va.—The Elm Grove Mining Co. is planning to increase the capital stock from $150,000 to $600,000 to purchase about 8000 acres of coal lands in Ohio and Marshall Counties. James A. Paisley is president.

Morgantown, W. Va.—The Scotts Run Coal Co. has awarded a contract for the construction of a new tipple and plans for other extensive improvements to cost about $75,000. The B. M. Chaplin Co., Morgantown, is the contractor.

Yeager, Ky.—The Detroit-Kentucky Coal Co. is making its first shipments of coal from the Robinson Creek operation near here, the shipments going to the markets of the Great Lake region. Regular shipments are scheduled for the near future.

Ridgeway, Penn.—R. G. Dowie and Gustave Josephson are extending their coal operations in Coal Hollow, opening up the top vein in a new place and also cellaring up an old heading long covered up, expecting to take out coal that was left there years ago.

Knoxville, Tenn.—Kentucky and Tennessee coal operators, who are suffering from a serious shortage in freight cars, have lodged a plea for relief with the Interstate Commerce Commission. More cars are sought to provide the South with more coal.

Memphis, Tenn.—On application of retail coal dealers that a special privilege tax be required of corporations which are supplying coal at cost to their employees, Mayor Litty has concluded that such corporations are not subject to that tax. He ruled to that effect on advice of the city attorney.

Philadelphia, Penn.—The newly formed Low Volatile Bituminous Coal Operators Association of Pennsylvania is sending out blanks on which its members will record accurate information as to the cost of producing coal, for the purpose of informing the national coal commission on this matter.

Columbus, Ohio—The Board of County Commissioners, through F. M. Rank, clerk, has advertised for bids for 3000 tons of mine-run for the county infirmary; 1000 tons of mine-run for the court house and 300 tons for the County Memorial Building. The bids will be opened Oct. 10. All of the coal is to be delivered.

Memphis, Tenn.—Proposed increased rates on bituminous coal from mines in Alabama to Memphis, Tenn., Vicksburg, Miss., and New Orleans, involving 10c. additional per short ton, and to Shreveport, La., involving 15c. per short ton, have been further suspended to Jan. 25, 1918, by the Interstate Commerce Commission.

Louisville, Ky.—The Board of Trustees of the Louisville Free Public Library has been unable to get a bid on its requirements of fifty tons of coal for several branch library buildings. It has made a new contract for a year with the central heating plant supplying the main library with heat and light at a figure almost double that of last year.

Connellsville, Penn.—The estimated production of coke in this region for the week ending Sept. 22 was 355,102 tons, 216,590 by the furnace ovens and 138,512 tons by the merchant ovens. The Connellsville region produced 190,000, against 186,458 tons of the previous week and the Lower Connellsville region 165,012 tons, as compared with 163,217 tons.

Lexington, Ky.—By a special arrangement with the Chesapeake & Ohio R.R., which is supplying an occasional car of coal for the utility power plants, the supply is maintained on a day-to-day basis. Preferential treatment has been given shipments to points on the Great Lakes. Many shipments designed for Lexington industrial plants are being confiscated by the railroads.

Zeigler, Ill.—The holdings in real estate here of the Leiter Estate and of Joseph L. Leiter personally are to be put on the market and the town of Zeigler will be open to the general public to engage in any and all kinds of business. In the past only the company was able to secure property on which to build mercantile establishments, and the town was a "closed" one unless the company saw fit to rent property to outsiders.

Frankfort, Ky.—The Frankfort Elevator Coal Co., by using its power winches, has devised a method of quickly emptying barges of water which accumulates in them when they stand for any length of time at the wharf. One end of a barge is so elevated that the water runs to the low portion, which is then emptied speedily by power pumps. Under the old procedure two days were required by hand labor to empty the barges.

Philadelphia, Penn.—Officials of the du Pont Powder Co. state that an inaccurate and false impression is conveyed by the statements of the coal operators to the Federal Government in their appeal for action to bring down the price of powder used at the mines. The du Pont company states that in 1914 its profits on mining powder represented about 10 per cent. of its business, whereas in 1916 these mining profits represented less than 1 per cent. of the total profits.

Paducah, Ky.—A general hearing on a proposed advance in freight rates on coal by the Illinois Central from mines in western Kentucky to all points in Kentucky is to be heard here some time this fall. A hearing by the State Railroad Commission of a protest by the Paducah Board of Trade against an advance of from 80 to 90c. on rates from western Kentucky to Paducah was to have been held on Sept. 25, but has been postponed and will be merged in the general hearing.

Philadelphia, Penn.—Fuel shipments of anthracite, bituminous and coke over the Pennsylvania R.R. for August show 874,030 tons of anthracite, a decrease of 127,168, compared with the same month of 1916. Bituminous shipments were 4,413,410 tons, a gain of 120,783 tons. Coke tonnage was 995,751, a drop of 178,138. From Jan. 1 to Aug. 31, anthracite accounted for 7,436,177 tons, a loss of 331,571; bituminous, 35,395,190, a gain of 2,818,714, and coke, 8,146,887, a drop of 1,535,349 tons.

New York, N. Y.—The Worthington Pump and Machinery Corporation announces the opening of a new branch sales office at the American Trust and Savings Building, Birmingham, Ala., to take care of a portion of the large territory hitherto controlled by the Atlanta office. Edward Stauverman, formerly with the Atlanta office, will be in charge as manager. The states of North and South Carolina and that portion of Georgia north of the Seaboard Air Line will continue to be served by the Atlanta office, under the management of A. W. Jones.

Columbus, Ohio—T. E. Davey, president of the Ohio Board of Administration, which has charge of about 22 institutions in Ohio, is opposed to the idea on the State of Ohio either leasing or purchasing a coal mine in order to supply these institutions with fuel. Some time ago when the idea was proposed a thorough canvass of the situation was made by Engineer Riddle, who secured options on several mining properties. But the matter was held up pending price fixing by the Federal Government. Opposition in the board also developed and it is doubtful if the state will close a deal.

Toledo, Ohio—Loadings at the docks of the Hocking Valley and Toledo and Ohio Central railroads have not been quite as good as in some former weeks. The principal falling off has been at the Toledo and Ohio Central docks. During the week ending Sept. 28 these docks loaded 63,000 tons as compared with 114,000 tons the previous week. The total handled by the docks since the opening of navigation is 1,586,699 tons. The Hocking Valley docks loaded 184,000 tons as compared with 180,000 tons the previous week. The total handled by these docks since the opening of navigation is 3,339,551 tons.

Springfield, Ill.—Complaint of the Chicago-Springfield Coal Co. and other owners of coal mines north of Springfield that they are being discriminated against by the Chicago & Alton Railroad Co. in favor of mines south of Springfield, as to coal rates to Chicago and Peoria, was given an all-day hearing by Examiner H. M. Slater of the Illinois Public Utilities Commission. The coal mines south of Springfield, as well as the complainants, were represented by an attorney. The operators of Indiana and of the Belleville district were also represented. Decision was withheld.

Market Department

GENERAL REVIEW

Scarcity of bituminous is the prominent feature of the present market as in past weeks. Demands everywhere exceed supply. Some stocks of contract coal being accumulated. Anthracite moving regularly. Mine price of pea decreased and dealers' margin fixed.

Anthracite—Although anthracite appears to be moving regularly and rapidly, many communities and plants are operating on a hand-to-mouth basis. With cooler weather the demand from householders, who have not as yet laid in their winter supply of fuel, is becoming insistent. In many instances, this demand is for coal without much regard to size or quality so long as it is pea size or larger. Stocks are nowhere large, and, in many instances, yards are almost bare of accumulations. This is particularly true of the domestic sizes. The adjustment of the price of pea coal downward and the fixing of margins allowed to dealers, have exerted a decidedly disquieting influence, and many dealers do not as yet know "where they are at." There seems, however, to be no inclination to over-ride the Government ruling, but many retailers complain that the margins allowed are not sufficiently large to permit them to do business. Shipments of the week to Upper Lake ports, particularly Lake Superior, have been heavy.

Bituminous—The movement of bituminous coal still continues to be almost entirely a matter of contract obligations entered into before price fixation by the Government. Many such contracts have not yet been filled and have a considerable time yet to run. As a consequence, some firms holding these agreements are now enabled to accumulate more or less sizable stocks, and, in some instances, firms thus stocking coal are having difficulty in preventing spontaneous combustion in the stockpiles. The failure of the coal administration to adjust bituminous prices upward on or about Oct. 1 has occasioned some chagrin and no little surprise among coal producers and dealers generally. Particularly since the fixing of the coke price at $6 it has been anticipated that prices of bituminous coal would shortly be changed in an upward direction. It is still thought that the Government cannot much longer continue to disregard the handwriting on the wall, and that prices must shortly be established sufficiently high to stimulate production to its maximum. Consequently, now, as during the past few weeks, the eyes of coal men are focused on Washington. The present situation is indeed serious and it is rumored in certain quarters that it is the deliberate intention of the Government to compel certain industries to shut down, thus, in a measure, relieving the fuel situation. It is thought, also, that the embargo on shipments to Canada will have a certain effect in loosening up the present stringency. While some scattering sales of $2 coal are reported, these are few and far between, and, in the vast majority of cases, are made in order to release cars and thus avoid the payment of demurrage.

Middle Western—Eastern coals are finding practically no place in the markets of Chicago and surrounding territory. Production in the Middle-Western field, on the other hand, has been considerably reduced. This reduction arises from several different causes, but the car shortage, which doubtless contributed to this condition to some extent, is not nearly as serious as the shortage of labor and its inefficiency. The men throughout the Middle-Western territory are not only insisting on an increase of wages, but, in many instances, quit work at a comparatively early hour in the day, thus decreasing the production. Throughout the southwestern portion of the country a strenuous market exists with a strong demand and little coal to fill it. Here, the supply of domestic fuel appears to be not equal to the demand, while the call for steam grades is good.

A Year Ago—Anthracite tight and fully controlled by the selling interests. Bituminous continues to advance with no indications of a halt. Confident predictions of still higher prices in the Lake sections. Middle Western operators swamped with orders and prices fluctuating over a wide range.

COAL PRODUCTION

Little change occurred in the ratio of tonnage produced to full-time capacity during the week ended Sept. 15, as compared with the two weeks immediately preceding. The index for all mines reporting since the weekly statistics were first undertaken was 72.3, a figure almost identical with that for the week of Sept. 1 (72.0). The index for the intervening week (74.8) can be accepted only with qualification because of the unequal observance of Labor Day. A strike in the Central Illinois field depressed the index for the state from 76.5 to 71.5. The continued operation of the priority order was noticeable in the returns from Ohio and western Pennsylvania, raising the index in the latter region to 83.5 per cent. of the present full-time capacity—the highest level it has yet attained. The strike in the Southern Appalachian field remained unbroken.

PERCENTAGE OF PRESENT FULL-TIME OUTPUT PRODUCED IN WEEK ENDED

State	Aug. 18	Aug. 25	Sept. 1	Sept. 8	Sept. 15
Iowa	85.3	86.3	81.4	79.4	89.7
Illinois	54.8	69.3	76.0	76.5	71.5
Indiana	71.8	69.3	72.9	74.9	70.8
Ohio	73.2	68.6	68.6	80.6	75.1
Western Pa.	69.4	75.2	76.9	81.9	83.5
Winding Gulf region					
West Virginia	83.0	88.7	87.8	74.7	86.0
Southwestern Va.	93.9	94.1	91.7	96.0	96.3
Eastern Kentucky and Tennessee	10.8	4.7	10.8	10.8	10.8
Alabama	85.9	96.1	83.6	82.2	85.4
Kansas and Missouri	72.2	76.2	79.4	79.2	83.9
Okla. and Arkansas	65.5	70.0	63.0	72.1	72.2
Total reporting from beginning	62.5	68.5	72.0	74.8	72.3

In the following week (September 16-22) the total production of the country, as indicated by railroad shipments, fell off nearly 5 per cent. One hundred fourteen roads, which originated 93.75 per cent. of the total rail shipments in 1916, loaded 183,000 cars in the week of September 22, as compared with 190,867 during the preceding week. Shipments fell off in every district presented in the accompanying table. The decrease was especially marked in Pennsylvania and Ohio, and in Illinois, Indiana and western Kentucky.

CARLOADS OF COAL ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

District	Week Ended Sept. 1	Sept. 8	Sept. 15	Sept. 22
Ala., E. Ky. and E. Tenn.	5,545	5,471	5,792*	5,300
Ill., Ind. and West. Ky.	22,329	19,459	22,749*	21,555
Pa., and Ohio	47,622	42,244	48,723	46,182
W. Va. and Va.				
Smokeless	13,549	11,856	13,879	13,226
High volatile	18,055	18,678	18,490	18,112
West of the Mississippi	1,923	1,664	2,053	2,031
Total	109,023	99,372	111,686*	106,406
Cars loaded by 114 roads, including those above	188,605	165,717	190,867	182,793†

* Revised from last report. † Preliminary estimate, subject to revision.

BUSINESS OPINIONS

The Iron Age—The steel trade has been given up wholly to a discussion, at times excited, of the terms and effects of the agreed prices on six products as announced from Washington, but as yet little light has been shed on the situation. Buying and selling are practically out of the question, and steel committees of manufacturers have been in daily session in New York this week working out prices on the full line of products in proper relation to those already fixed. Another conference at Washington will follow and next week the President will announce prices on the various grades of pig iron, on semi-finished steel and a long list of rolled products. In all the confusion it is clear that the new prices will figure but little in general business for weeks. The decrees of the priority committee at Washington really control the industry and while Government demand centers on a few lines, that control affects the supply of steel available for other finished forms. On the question of contracts manufacturers quite uniformly answer that these are to be enforced in the same way as the Lever act provided for the carrying out of fuel contracts.

Dun—Further downward revisions of quotations, in steel and iron through official action and in certain other commodities from different causes, give promise of greater activity, though not all of the price uncertainties have ended and recovery appears in some quarters where continued yielding was expected. But there is a clearer outlook and more confident sentiment in business and its volume enlarges, not without fluctuations and in some cases moderate, but yet distinct.

Bradstreet—Price adjustments temporarily restrict fresh developments in some of the larger lines without, however, reducing the rapid pace of industrial operations or of trade in essential commodities, and, in a broad sense, the swing is still upward, governmental buying plus ordinary domestic requirements superinducing an enormous, in fact, record business.

Dry Goods Economist—The great increase in taxation, the obvious duty of the American public to put its spare money into Liberty Bonds, the Government's fixation of prices on various products and its control of exports, all tend to slow up in some degree the purchase of merchandise by distributors.

Marshall Field & Co.—Current wholesale distribution of dry goods is in excess of the volume for the same period of a year ago. Road sales for both immediate and future delivery surpass those of a year ago which were very heavy at that period. Merchants have been in the market in slightly smaller numbers, but report an excellent retail business. Collections are considerably ahead of the week last year.

Atlantic Seaboard

BOSTON

Bituminous situation ripe for a panic, without the usual feature of soaring prices. Rehandling plants unable to meet demand for steam coal. Increasing apprehension over possible commandeering of colliers. Problem to get New England's supply forward. Anthracite business on a hand-to-mouth basis. Retail demand becomes insistent.

Bituminous—Any competent analysis of the state of coal traffic in this territory shows abundant cause for alarm. It is figured that the tonnage for the three ports of Providence, Boston and Portland approximates not far from 8,000,000 tons. Of this about 2,000,000 tons is carried in barges, leaving about 125,000 tons a week to be brought in steamers. If a single steamer of 8500 tons' capacity is removed for overseas service, and not replaced, it means that more than 400,000 tons yearly is lost to consumers in this territory. It is shown the railroads are utterly unable to handle more coal than they are now doing, so that all-rail there is little hope of increased tonnage.

Moreover the railroads themselves are obliged to accumulate stocks and cases are frequent where locomotive fuel that would normally move wholly by rail is being shipped in boats from New York and Philadelphia. Consumers generally have been hoping against hope but when cold weather comes it is hard to see how a serious situation can be avoided.

The large number of New England plants working on Government contracts makes it seem likely there will be present all the elements of a panicky state, except that the strong arm of the Government will be used to prevent extreme price levels.

Strenuous efforts to buy and failure to get supplies all-rail have resulted in a rush on the part of those plants not sufficiently covered by contracts to close with various rehandling plants in position to ship to points well inland. Matters of customary routing are disregarded; if a plant is on the B. & A. the buyer does not necessarily wait for spot coal to be offered at a

tide-water depot on that system. He buys the coal where it can be had, trans-ships it and pays the arbitrary wherever that seems desirable. Sales of considerable tonnage have been made in this way the past fortnight, to such extent, in fact, that the rehandlers are beginning to be wary.

At first it looked to them like a good opening to reimburse themselves for high barge and steamer rates and incidentally a premium here and there paid for coal before the President's order went into effect, but lately, with the possibility of ships being taken from the trade the rehandler may well query whether it is not the part of wisdom to conserve his regular receipts by water to protect his contracts with regular customers.

It is this condition which is giving the trade genuine alarm. The commandeering of boats is not confined to steamers alone; it is operative with sea-going tugs as well, and therefore seriously affects the movement of barges. So far the trade has got little information on the reported intention of the Government to use certain foreign tonnage that is less adapted to ocean going under present conditions to replace the bottoms taken from the coastwise service.

Pocahontas and New River at Hampton Roads are substantially unchanged. It is next to impossible to buy spot coal. The agencies are exerting every effort to provide good dispatch for ships on their contracts, but occasionally there is serious delay.

Anthracite—Somewhat improved movement by water has made conditions less difficult for the retailers. Consumers are insistent, however, and the first cold weather is dreaded by those conversant with the trade. There must be a large tonnage in the cellars of the general public, but, of course, there is a large tonnage also which is strictly on a hand-to-mouth basis.

Very little "independent" coal is offering. Sources of supply that seemed abundant last year are yielding only light shipments for this territory.

NEW YORK

Dealers disappointed at indefinite announcement from Washington but begin work of ascertaining selling prices. Not much change expected. Domestic coals scarce at Tidewater and stocks of smaller sizes low. Wholesale price for pea coal adjusted. Central Pennsylvania operators surprised at failure to advance prices. Situation serious. Many plants may be seriously hampered by lack of fuel.

Anthracite—The announcement of Fuel Administrator Garfield establishing retail prices left the dealers "in the air," so to speak, as to what the selling figures will be. Dealers contend that it will be impossible for them to compute the average cost of coal every 15 days unless they increase their office force. It was expected that the Washington announcement would name a definite figure at which the dealers could sell their coal instead one of a complicated character, but depending upon the newspaper announcement to be correct, and in the absence of an official notice, the dealers set to work to figure out the new retail prices. In the meantime orders were taken subject to the new prices, whatever they might be.

The reduction of 60c. in the mine prices of pea coal from those fixed in August by President Wilson was no surprise to the trade, it having been forecasted that this figure would be lowered. Wholesale dealers at once adjusted their price schedules to meet the new figure and now it is expected there will be an increased demand for pea coal which has already been short in supply for several weeks.

There has been no letup in demand and supplies at the New York Tidewater market are about as low as at any time within the past few years. Company coal is not in heavy supply but the big producers are able to take care of their customers in fair shape. Most of the independent coal is finding a market in the West but not altogether at the direction of the operator. It is understood that much of the coal so shipped has been sent at the direction of the Federal authorities who evidently believe the East can be taken care of later on in the season.

Wholesale dealers complain of the lack of domestic sizes and their inability to fill orders. Some have refused new orders, not knowing when they will be able to make shipments. In the meantime, many retail yards are nearly bare of supplies, the coal their owners are able to secure being used to fill outstanding orders.

The buckwheat sizes are in heavy demand, with supplies low. Buckwheat No. 1 is nearly as scarce as pea, with rice and barley in slightly better supply. Mine quotations for the smaller sizes show advances of from 10 to 20c. over Tidewater quotations on the same basis.

During August 3942 tons of anthracite coal were exported from this port. This tonnage had a valuation of $29,317.

Current quotations, per gross tons, f.o.b., Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$5.95	$6.70
Egg	5.85	6.60
Stove	6.10	6.85
Chestnut	6.20	6.95
Pea	4.70	5.45
Buck	3.95@4.65	5.10@5.30
Rice	3.40@3.60	3.80@4.10
Barley	2.90@3.15	3.00@3.30
Boiler	3.15@3.30	.....

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The expected change in prices for coal coming to this market did not materialize and consequently conditions continue stagnant. Consumers relying on free coals have been operating their plants on narrow supplies, expecting that the announcement from Washington would contain some relief for the operators who send their coals here. They do not see much hope now of averting a shutdown of operations and it would not be surprising if this should become necessary shortly.

The market is practically clear of free coal. Some coal is being sent here, but it is on contract and the spot coal buyer has to go without. Sales of $2 coal are seldom heard of, and then only to save demurrage charges. Some houses say they have not taken an order in several weeks and are barely able to keep their contracts moving because of the poor car supply and the activity in the Lake and Western trade.

Because of the failure to advance the price at the mine for coal sent to the eastern markets, dealers see an active season for the smaller anthracite sizes with high prices and a serious condition confronting dealers in bituminous, because of its scarcity, the inability of operators to produce coal except at a loss, and, in addition, the demands to be made on them for an increase in wages.

Shipping is being seriously interfered with by the lack of coal, many vessels being detained for days on this account.

PHILADELPHIA

Anthracite retail price fixing causes upset. Dealers fill orders entered at old prices. Shipments by big companies light. Individuals take care of their best trade. Heavy Government shipments. Steam sizes continue to show strength. Bituminous prices unchanged, but hope for relief is entertained. Labor problems serious. Coke prices fixed. Car supply unimproved. Contract customers getting good stocks.

Anthracite—The order from Washington fixing the retail prices was something of a shock to the trade. There is a general claim that it is unfair and does not allow a reasonable profit to the dealer. The retail men had for some time expressed confidence that the prices to be fixed would be on an equitable basis inasmuch as full information had been procured some time since as to the dealers' profits.

Of course there is not the least doubt but that the trade will strictly comply with the terms of the order so far as possible, but if it is true as some dealers claim that on certain sizes of coal they will suffer an actual loss they may refuse to sell that coal. They insist that 30 per cent. increase over the gross margin of July, 1915, is far from covering the increases in the various expenses entering into the delivery of fuel.

With the opening of the week the dealers were fairly swamped with requests to enter orders, but most of the dealers refused to take on any new business until later in the week, or at least until they had time to give the matter full consideration. In the meantime, they busied themselves in filling as many old orders as possible. They felt that orders which had been taken at a certain price were contract obligations and were entitled to be filled at the old figures. If the customers did not care to receive the coal at the price originally agreed upon they were given the option to cancel the order. However, few cancellations were given, as the people are anxious to receive fuel.

The consuming public was particularly anxious to get pea coal at the reduction of 60 cents a ton, especially since the weather has once more grown much colder. As a matter of fact the shipping companies were slow to announce that they had accepted the new figure on pea coal, although one of the largest shippers came out promptly stating that the new price for pea coal would be in accordance with the Government order, i.e., $3.40 per gross ton at the mines. This figure it will be noted is 10c. less than the contract price of $3.50, at which large quantities of this coal were sold earlier in the year. Dealers point out that their chances of getting pea coal are lessened by the new price.

There can be no denying that coal is scarce, particularly since the month of September brought a minimum tonnage to this city and vicinity for domestic use. With some exceptions we believe the dealer is more concerned for his future rather than his present needs. Of course, while quite a few dealers have many unfilled orders on their books, few have any stocks on hand. What is probably more to the point is that the dealers who depend almost entirely on independent operators and who have been cared for by them, now have fair stocks and little or no business. In other words, retailers who have been fortunate enough to receive coal right along find there is no new business coming to them and the coal is piling up in their yards. Of course, much of this latter condition has been due to the newspaper statements that coal would drop in price on Oct. 1.

Some mining company officials express the belief that the retailers do not need coal one half as badly as they claim they do, and that if the tonnage was directed this way for ten days the bottom would drop out of the abnormal demand. The big companies are apparently not worrying about the situation here and seem content in their belief that this market can be taken care of at any time. Coal will not be plentiful all winter and the big buyers will at no time be able to carry full stocks, but unquestionably there will be sufficient for economical use.

Conditions on the line of the Philadelphia & Reading Ry. have not improved the past week and the big shippers intimate that a change in the car supply has upset their calculations. There has been an improvement in shipments to the Pennsylvania R.R. dealers on account of the Philadelphia & Reading removing the embargo on P. & R. cars for Pennsylvania delivery and the latter road has in turn begun to furnish the mines with a considerable number of its cars for shipment to Pennsylvania R.R. points. This change came about, it is understood, through instructions from the Federal Trade Commission. The Philadelphia & Reading Ry. still continues its embargo on cars to the B. & O. and Western Maryland Ry.

It is understood that particularly heavy shipments are now being made to the army cantonments. It has been estimated that the requirements on this business for the coming fall and winter amounts to 350,000 tons of anthracite. It is understood that the big companies will be asked to supply 80 per cent. of this coal and the individuals will be called upon for the balance.

The Government continues to exact complete information from every shipper regarding the distribution of tonnage. It is remarkable how close a touch the authorities in Washington are keeping on the situation and the mass of information they are acquiring.

The steam sizes have gained in demand and increased in price. Buckwheat around $4 shows considerable activity. Rice is quoted close to $2.85, with barley from $1.80 to $2. Culm, too, is growing in popularity, chiefly to mix with soft coal and sales have been made at $1.

Of the family sizes all company buyers continue to ask for all of them, but there is less stove in the yards and more call for it than any other grade. Egg, too, is extremely short. Chestnut is active because a larger proportion of this size has been shipped and delivered to the consumer, but there is little of it stored in the yards.

All shippers report collections the best in the history of their business; also that they intend to keep them that way.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide		Line	Tide
Broken	$4 55	$5 70	Buck	$2.90	3.30
Egg	4 45	5 75	Rice	2.40	3.40
Stove	4 70	6 00	Boiler	2.20	3 30
Nut	4 80	6 05	Barley	1.90	2.1
Pea	3.40	4 30			

Bituminous—The expected relief as to change in prices has not as yet arrived, but all interested feel certain that something will be done soon. It seems to be the general impression that the plan likely to be followed by the Government will be that of re-classifying the districts as comprised in the former order into smaller divisions, such as a fixed price for all coal mined in central Pennsylvania as against that produced in the western part of the state. Whatever the plan may be the change cannot come too soon for both the consumer and shipper if there is to be any relief in the way of increased production.

While the matter of labor is quite menacing at this time it is hoped and really believed that differences will be adjusted without any strikes taking place. The shippers here place much confidence in the statement of Rembrandt Peale, prominent local operator, who told the Washington fuel authorities that it is his belief that the questions at issue can be adjusted amicably in a short time. Of course, much will depend on what action the Government takes as to the appeal for higher prices, as it hardly need be said that under the present schedule higher wages are absolutely impossible.

The bituminous labor problem has also been rendered more acute by the fact that after the Government had fixed the coke price of $6 per ton the men at those plants were granted a 10 per cent. increase, which brings their scale above the bituminous men and it is now reported that these latter workers are drifting into the coke region after the higher wages.

The car supply continues to hold back production and this week it is reported by a number of shippers that they have only been able to make about 65 per cent. shipments on their contracts. However, the large consumers of coal continue to get good supplies, to such an extent that instances of spontaneous combustion are becoming common in the stock piles of concerns unaccustomed to stock so heavily. In fact, contract shipments to some parties have been in such good volume that we know of instances where the consignees have had coal to sell and are dealing it out to less fortunate consumers.

Rumors continue to abound that some sales of coal are being made at fancy prices in excess of the Government figures and while these stories have persisted for some time it is not believed any one would be so foolish as to be tempted to engage in business of this nature.

BALTIMORE

Coal trade in whirl of uncertainty over effect of price fixing. Supplies of soft coal run low, and stories of Government plan to curtail uses appear. Anthracite stocks short.

Anthracite—The entire trade is in a state of uncertainty as to the effect of the latest Government announcement of price fixing. Many well-posted coal men openly declare that they can not do business on a 30 per cent. margin over 1915 in the face of increases in labor, supplies, etc.

During the week the Edward Stabler, Jr., Coal Co. went into the hands of receivers. It is stated that this firm was unable to get through coal it needed from its old connections. This greatly added to its troubles. Some other coal firms here are reported to have hardly turned a wheel in September. The usual October advance in the retail trade of 25c. a ton to care for extra cost of winter hauling will probably hold off for a time. The old September schedule is still in vogue.

Bituminous—Many important plants which use bituminous coal, and which in a number of cases hold Government contracts, are desparately short of fuel. The coal piers have been largely swept clear, and at times have been left almost without a car. The all-rail movement too is far behind requirements, and the increasing stress for fuel has caused hundreds of appeals to be sent to Washington for coal. Among others the city has been promised fuel with which to run needed public service stations, but no coal is promised for schools and similar institutions.

Not a few industries have been told by their coal connections that they can not expect to be kept going, and meanwhile stocks have been sadly depleted. An early winter will tie things up in bad shape. Talk comes from Washington that it is planned by the Government, if necessary, to commandeer and close a number of industrial plants whose operation is not considered vital. A move may be made at any time to order only essential plants to keep open, and to close all others, in order to conserve the coal supply.

All the coal companies with headquarters here report added troubles among miners. There has been talk of the Government allowing a revision upward of the soft coal prices at the mines, and then endeavoring to get the operators to agree to certain wage increases. Coal men here predict that such action would do little toward stimulating production.

HAMPTON ROADS

Good inquiry for new business, but few quotations named by shippers. Some little tonnage sold at Government prices. Shipments on contract good. Serious congestion at both Newport News and Sewalls Point piers.

While there are a number of consumers, who are not under contract, in the market for coal they are having some difficulty in securing their requirements. The majority of shippers are not offering anything and only a few are accepting orders at Government prices. As will be noted from the tonnage shipped through Hampton Roads for the month of September the deliveries under contract have been heavy.

For the first time in its history the Virginian Ry. dumped more coal over its Sewalls Point pier than the Chesapeake & Ohio at Newport News. This was for the past month, the Virginian dumping some 20,000 tons more than the C. & O. In this connection it is interesting to note that Newport News is the stronghold of the Tidewater Coal Exchange's pooling operations. At present the congestion of vessels waiting berths at Sewalls Point and Newport News is causing considerable delay and there does not seem to be any immediate relief in sight, as arrivals about offset the vessels which are loaded.

Stocks are in fair shape as a whole, though some shippers find themselves temporarily short. There is some improvement in the issuing of bunker licenses by the Bureau of Export Licenses at Washington, but cargoes are still held up for what seems to be an unreasonable length of time. There are at present a large number of neutral steamers in Hampton Roads awaiting either bunker or cargo licenses. Prices for anthracite are around $9 per net ton. Retailers are trying to figure out just what price they will be allowed to charge.

Dumpings for the week ending

	Sept. 22 Gross Tons	Sept. 29 Gross Tons
Norfolk & Western	140,638	117,523
Virginian	80,828	94,804
C. & O.	83,908	82,871
Total	305,374	295,198

Dumpings for the month of September were:

	Gross Tons
Norfolk & Western	505,302
Virginian	364,660
Chesapeake & Ohio	341,269
Total	1,211,231

Lake Markets

PITTSBURGH

Some business being done in anticipation of new price from Washington. Coal brokers want commission retained. Export embargo will increase supplies.

The prospect that has prevailed during the past two or three weeks that the authorities at Washington would advance the price of coal has tended to make operators still more disinclined to sell in the market, but some buyers and sellers have found a way of getting together, by making a transaction at the Government price, with the understanding that if a higher price should be set there would be a readjustment. A little business has been done on this basis but on the whole the market has been decidedly inactive.

In some quarters surprise is expressed that the latest Government figures indicate that production has been maintained in this district, as compared with the rate prevailing at the time the Government price was fixed, and the showing is considered reassuring, although it is pointed out that coal frequently accumulates between mine and railroad yard scale, and the figures will not be considered conclusive until there is a showing for a longer period.

At this writing (Tuesday) wholesale coal dealers are in Washington endeavoring to persuade the Coal Commissioner to retain the brokerage on coal in the new price schedule, there having been a report that the 15c. brokerage was to be eliminated. The brokers claim they cannot secure a commission from the operators and must get their margin at the selling end.

Commercial consumers of coal have been making representations to the Washington authorities that the priority order in favor of Lake shipments has deprived them of much coal and caused them to suffer hardship. It is claimed the Priority Board has stated that the railroads have been interpreting the order too literally or too strictly, and it is suggested in the trade that the railroads have done this in their own interest, as there is a greater profit in the long haul to Lake Erie than in the shorter hauls to Youngstown and other important manufacturing centers. It is expected that the embargo on coal exports to Canada, effective Oct. 1, will relieve the situation materially, if it is true as claimed that 30 per cent. of the coal shipped lakewards has been diverted to Canada, since the supplies for the Northwest could be increased and more coal would nevertheless remain for local consumption.

We continue to quite the market at $1.75@1.90 for slack, $2@2.15 for mine-run and $2.25@2.40 for screened, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous trade still waiting for a price. No coal selling at the fixed rates. Still sending reports to Government. Anthracite dispensed with locally. Anthracite heavy to Lake Superior.

Bituminous—The local jobbers have about despaired of a price by which they can do business and some of them are cutting down their office forces to keep from running too far into debt. For awhile they confidently looked for an advance of a dollar or so, but they get no encouragement from Washington. If their queries are answered there is no promise given, but a further question is asked as to how much coal they have shipped lately and where it has gone.

The bituminous prices remain nominally as before, though practically all the coal goes on contract at higher prices. Quotations are per net ton, f.o.b. Buffalo, with no extra price for special grades:

	Slack	Lump
Pittsburgh	$3.30	$3.80
Bessmer	3.20	3.70
Allegheny Valley	3.15	3.65

Anthracite—The supply of coal locally is still exceedingly low and it is not likely to increase much till it is assured that enough has gone up the Lakes to make sure of a supply for the Northwest. Shippers continue to say that there is coal enough for all if it is distributed properly, but they are not able to convince the consumer and retailer, so that the clamor for coal goes on as before.

It is too soon yet to say what the effect of fixing retail prices will have on the trade, but it is not supposed that it will have the unfavorable result that took place in the bituminous trade, especially as the regulation wholesale prices did not.

Shipments by lake are not quite as heavy as formerly, but the shortage of tonnage is no doubt accountable for this. Loadings for domestic ports during the week were 109,300 net tons, of which 71,800 tons cleared for Duluth and Superior and 1200 tons for Hancock, 11,500 tons for Chicago, 17,600 tons for Milwaukee and 7200 tons for Green Bay.

Freight rates are strong at 75 cents to Green Bay and Hancock, 60 cents to Chicago, 50 cents to Milwaukee and 45 cents to Duluth.

TORONTO

Trade conditions unsettled awaiting price adjustment at mines. Stocks on hand light and little coming forward. Dealers approve Dr. Garfield's distribution system.

The trade conditions here continue unsettled, awaiting the adjustment of prices at the mines. In the meantime no contracts are being made and orders are being held back. Stocks in hand are light and though railway deliveries are fairly prompt, but little coal is coming forward. Coal dealers strongly approve the system adopted by Dr. Garfield, American fuel administrator, for the distribution of coal, for insuring an even and impartial distribution and eliminating the coal broker. Owing to continued mild weather the difficulty of obtaining prompt local deliveries has not occasioned such serious inconvenience as would have otherwise occurred.

Quotations for best grades per short ton are as follows: Retail anthracite, egg, stove, nut, and grate, $9.50; pea, $8.50; bituminous steam, $9; stack, $8 to $8.50; domestic lump, $10; cannel, $11; wholesale f.o.b. cars at destination, three-quarter lump, $7 to $7.50; stack, $6.85 to $7.

TOLEDO

Evidently the number of cars turned to the mines to be loaded for Lake shipment is not so great as during the past three weeks. Municipal and industrial plants are receiving more coal than formerly, and dealers report a little more anthracite coming in than usual.

The actual movement of coal, adequate to supply the needs of this section of Ohio, is still a problem to be solved. Although more coal is arriving for domestic consumption than during the past month, factories and dealers are still appealing for more coal. Everyone is optimistic for future conditions, owing to the large number of cars which will be released from Lake service at the close of navigation. It is hardly expected, however, that the movement of winter coal will begin much before Nov. 15, and consequently consumers are hard put to it to secure their immediate wants.

Lake shipments are being maintained at record-breaking volume and the vessel supply is easily taking care of all rail shipments to the docks. Coal shippers assert the close of the shipping season will find the Northwest with sufficient coal on hand to take adequate care of its winter needs.

Prices, f.o.b. mines, are as follows:

	Mine-Run	Lump and Egg	Nut and Slack
Hocking and Pomeroy.	$2.00@2.35	$2.25@2.60	$1.75@2.10
Kentucky..	1.95@2.40	2.20@2.65	1.70@2.15
Pocohontas.	2.00	2.25	1.75
West Virginia splint....	2.00	2.25	1.75

DETROIT

Demand for domestic and steam sizes of bituminous is active with supply short. Anthracite receipts fall short of needs. Lake movement is regular.

Bituminous—While the demand from steam plants is maintained in considerable volume, no improvement appears in the supply of coal moving to Detroit jobbers and wholesalers complain that there is no free coal in the market and that they are unable to arrive at any satisfactory results in their efforts to obtain coal. While there are frequent rumors that one or another factory is running low on supply, or is about to close for lack of coal, these reports seem exaggerated, as the steam plants, though deficient in supply, have been able so far to continue operation. Except for shipments of coal to apply on contracts, jobbers say there is little to be had.

Lower temperatures are bringing a more active inquiry from householders. The announcement is made that only 35 per cent. of the householders have a full winter supply, 15 per cent. a partial supply and 50 per cent. no coal on hand. It is calculated that 50,000 homes in Detroit are without coal. With retailers' supplies low and only four weeks to make good on the deficiency, the coming of colder weather is a matter of apprehension.

Arthracite—Retail dealers assert that it is possible to obtain anthracite only in small quantities and that shipments are uncertain. Despite reports from producing companies that shipments into Michigan have been of normal volume or in excess of previous years, there seems to be a serious shortage of supply, both in retail yards and in the hands of consumers. Jobbers say they are unsuccessful in efforts to get stock on terms which will permit resale, at government prices.

Lake Trade—Though retarded earlier in the week by lack of cars to move coal to loading docks, Lake shipments are being sent forward with a good degree of regularity. Carriers are receiving 50 cents a ton on cargoes to Lake Superior and 75 cents on coal sent to ports on Lake Michigan.

COLUMBUS

The coal trade in Ohio is still unsettled because of governmental action, or rather lack of action in many instances. Domestic and steam demands are active. Production is decreasing.

Tightness still characterizes the coal trade in Ohio. With the Lake trade booming and good demand from steam users, domestic buyers have been left out in the cold, so to speak. In other words, there are grave fears of a shortage among householders unless steps are taken to relieve the situation. With the appointment of a fuel dictator in Ohio it is expected that some relief may be brought about.

Steam business is rushing in every way. Plants engaged in making power for municipalities and traction lines are probably the hardest hit by the fuel shortage. In some instances these plants have had to partially suspend operations. Appeals made to state authorities have brought temporary relief. A large amount of slack has been released from Lake shipments to supply steam plants in northern and northeastern Ohio. Railroads are still taking a large tonnage and in quite a few instances they have confiscated cargoes. As the winter approaches, stocks of steam coal are gradually being reduced and only a few users have much surplus stock.

Retail trade is slow, due to shortage of stocks in the hands of dealers. Consumers are in the market for their winter's supply of fuel, but in most cases they have not been taken care of. It is estimated that there is less than 40 per cent. as much coal in the cellars and bins of householders as at the corresponding time in previous years. This situation is rather serious and a rush is expected at the first cold snap. Retail prices are still high because of failure of federal authorities to fix retail quotations. Pocahontas is in good demand, and stocks are extremely scarce. The same is true of West Virginia splints and certain other grades.

Production in various Ohio fields shows a falling off. While labor troubles have been settled, still the car supply is not as good as formerly and this is curtailing the output. In eastern Ohio the production is about 65 per cent. of the average and the same figures are reported from Cambridge and Massillon. The Hocking Valley and Pomeroy Bend districts show up better.

Prices on short tons f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump.....	$2 25	$2 60	.....
Inch and a quarter.....	2 25	2 60	$2 25
Three-quarter inch.....	2 25	2 60	2 25
Nut.....	2 25	2 60	2 25
Egg.....	2 25	2 60	.....
Mine run.....	2 00	2 25	2 00
Nut, pea and slack.....	1 75	2 00	1 75
Coarse slack.....	1.75	2 00	1 75

CINCINNATI

Imminent danger of fuel shortage is the dominant factor in the situation, and the price question is taking a back seat. Local and state authorities are attempting to secure Government action.

The continued failure of reserve supplies of coal to gain anything, in the face of a heavy demand, both for immediate consumption and for winter use, has resulted in general alarm, with calls for Federal aid from both local and state authorities, as well as from business organizations. The low stage of the river has prevented any movement whatever of coal by this route for some weeks, even the use of artificial "waves" being impossible at present. Furthermore, the heavy movement of coal to the North and Northwest, both by rail and via Lake, is having the natural effect of reducing the amount available for Cincinnati and vicinity.

While domestic consumers are generally refraining from buying, in the hope of getting lower prices, retailers are in the market extensively, realizing the necessity of getting some coal, almost regardless of price. Large consumers are taking the same view, but are unable to secure more than small quantities, as there is virtually no free coal on the market. Supplies for municipal purposes are also very low. In view of the heavy general demand and the limited transportation facilities available, there is at present no solution of the difficulty apparent.

LOUISVILLE

All eyes on Washington, looking for action to relieve situation. Western Kentucky overwhelmed with orders that cannot be accepted. Retail conditions alarming and supplies short everywhere.

With the whole of the coal trade in this section looking to Washington for some action which will relieve the present tense situation, and action of some sort expected from day to day, this market is showing only an increase in the tenseness which has been developing for weeks. There are reports from all over the section of exhaustion of coal supplies and of public utility plants suspending, while industrial and domestic requirements ordinarily supplied from the field tied up in a strike are not being taken care of.

Operators in western Kentucky are daily refusing orders for large amounts and are doing what they can to look after their own customers and still provide for the wants of those who enjoy preferential treatment. Industrial consumers in the North Central states as well as those further south have representatives at numbers of the western Kentucky mining centers trying to get coal but without being able to offer the operators any inducements to let them have it. The domestic situation is extremely disquieting. In Louisville, for instance, a reliable estimate places the total amount of coal in retail yards at 26,000 tons. Last year at this time one dealer alone had 83,000 tons in storage. This year less than half of the normal amount of coal has been laid in by domestic consumers for winter. Domestic consumers, still waiting for the reduction in domestic prices, are in numerous instances buying in two and three-ton lots, with a view to making partial preparation against what they are beginning to be convinced will be a shortage.

BIRMINGHAM

Market void of developments awaiting new price schedule. Demand strong from non-contracting consumers, but little coal available to cover. Production slightly better than last week, being about 80 per cent. normal.

All the activity noticeable in local trade circles is evidenced by the spot buyers. Producers have little coal available to meet the call from this class of customers, the output as yet not being equal to contract requirements. Deliveries are badly in arrears in a great many instances.

Labor conditions are slowly improving. Negroes are returning from the North and West in large numbers and a great many of them being experienced miners are seeking and readily finding employment in the coal mines. There is also a shortage of common labor around the mines, which is being gradually reduced by the influx of negro laborers.

Coke

CONNELLSVILLE

No price yet on foundry coke. Market quiet. Larger offerings expected. Production and shipments unchanged.

No further action has been taken at Washington regarding coke prices and the only thing the market has to go upon is the $6 price announced Monday of last week. There is no differential for foundry coke and no allowance for brokers. It is regarded as improbable that any brokerage will be allowed in the selling price, brokers being expected to obtain their commission, if any, from sellers, but a differential for foundry coke will no doubt be established eventually.

There has been only a limited amount of coke business done in the past week, all at the $6 price. Brokers have done a small amount of business, buying and selling at the same figure, simply as a matter of accommodation to customers, whose trade has been profitable to them in the past.

The offerings of coke have been extremely limited and the trade is surprised that there has not been more coke available, since production is substantially the same as formerly. One explanation offered is that since the price was fixed all producers have been shipping maximum tonnages on contracts, perhaps in most instances in excess of customers' requirements, and as soon as this coke banks up there will be more left for the open market. There were also sales of specific quantities, 50 or 100 carloads, and operators have hastened to fill these orders to the limit, so that when they are out of the way there may be additional supplies in that direction. A curious feature of the situation is that a great deal of contract business in furnace coke was done for the year 1918, the contracts not starting until Jan. 1, and while there are some contracts in force to the end of this year the situation is that there will be more spot coke in the market during the next three months than there will be later.

The general wage advance of about 10 per cent., under the lead of the steel Corporation, goes into effect as of Oct. 1, this following a similar advance which became effective May 1.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 22 at 355,102 tons, an increase of 5427 tons, and shipments at 345,334 tons, a decrease of 3441 tons.

We quote the market on furnace and foundry coke, spot or contract, at the Government price of $6 per net ton at ovens.

Buffalo—The price of $6 at the ovens is announced, but it has not been worked out here yet, beyond the statement by coke sellers that they have nothing to sell, as in the case of the bituminous jobbers. No information is received yet as to the prices of the lower grades or what is to be paid to jobbers. With merely the freight added the price per net ton, f.o.b. Buffalo would be $7.85. Receipts of iron ore are large, being for the week 304,824 gross tons. Delays at unloading docks are increasing, but are not as great as at other Lake Erie ports.

Birmingham—There is little, if any coke available to the spot trade in this district or for new contract business. Spot foundry readily brings $16 per net ton ovens and contract prices range from $11.50 to $12.50 ovens.

The food control bill does not contain any machinery for the fixing of coke prices, and inasmuch as Alabama producers were not invited to participate in the conference recently held in Washington at which Connellsville district prices were agreed upon, it is believed that no steps will be taken by the Government for the revision of prices in the Alabama field.

Middle Western

GENERAL REVIEW

Supplies of Eastern coals practically shut off in Chicago and adjacent territory. Production is considerably reduced in the Indiana and Illinois mining districts due to various causes chief of which is labor shortage and the inefficiency of the men.

The coal question in the Mid-west territory, within the past week, has become a serious one, and there is much uneasiness felt among shippers as well as among retailers and buyers for large industrial concerns. There has been a regular stampede for coal—many dealers and consumers hundreds of miles from Chicago have come to this market endeavoring to secure adequate supplies.

The supply of Eastern coal has become so limited that various ways and means for securing fuel are being devised by the coal men. Not only is there a shortage of Ohio and West Virginia coals, but the loss in production in the mining districts of Indiana and Illinois has seriously cut down the storage piles in retail yards and those of manufacturing concerns. The labor supply has been anything but satisfactory the past few weeks and there seems no prospect of improvement along this line until such time as the Coal Dictator in Washington agrees to the requests of the operators for increases in their selling prices which will offset the wage increases demanded by the miners. There have been a number of strikes in the southern Illinois mines the past week, and in each case the demand was for increases to the day laborers.

A steady exodus of men from the mines has taken place—first to the army, second to the cantonments, and third to the railroad shops, munition plants and other industries where the compensation exceeds that covered by the agreement between the operators and miners. Unless the operators concede the demand for an increase there will be a further exodus of the workmen causing additional loss in tonnage production. The operators also know that to grant all the demands will further decrease the efficiency of the miners unless some new spirit comes to rouse the workmen.

Railroad congestion is increasing, and the switchmen's strike in the Gary, Ind., district has interfered with the movement of coal to Chicago and territory adjacent. The supply of cars in the Indiana field has been growing worse, while on the other hand few of the Illinois mines have lately suffered on this account due to petty strikes and the general inefficiency of the men which has cut production creating a lesser demand for empties.

CHICAGO

Shortage of fuel now existing among numerous Chicago retailers. Consumers of domestic sizes required to accept any grade offered. Many householders awaiting fixing of retail prices.

Chicago retailers and a number of the manufacturing plants are face to face with a serious shortage of fuel. During the past week retailers were unable to secure in sufficient quantities even the lower grades of coal—the latter as a rule being a drug on the market. What the situation will be under fixed retail prices, which will stimulate buying by the householder, is not easy to contemplate.

While Chicago dealers are quoting for sidewalk delivery anthracite at $9.80, Indiana and Illinois at $5.45, and Solvay Coke at $8.75 per ton, they are making hardly any promises regarding Pocahontas and Ohio grades, and most of the retail yards are depleted of Eastern coals. There has been a fair arrival of anthracite via boat but this is only in keeping with present demands and there has been no accumulation in storage piles.

Indiana mines are experiencing a serious car shortage, and operators claim this is due to the fact that cars have been diverted to the Lake traffic by order of Director Lovett, and that the net shortage is fully 40 per cent.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Williamson and Franklin	Saline and Harrisburg	Fulton and Peoria	Springfield	Carterville	Grundy, La-Salle, Bureau and Will
Steam lump	$2.20@2.35	$2.20@2.35	$2.20@2.35	$2.20@2.35	$2.20@2.35	$2.65@2.80
Domestic lump	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80
Egg or furnace	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80
Sm'l egg or nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80
Stove	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80
Chestnut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80
Pea	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80
Washed egg	2.20@2.35	.....	.....	.....	2.20@2.35	2.65@2.80
Washed stove	2.20@2.35	.....	.....	.....	2.20@2.35	2.65@2.80
Washed nut	2.20@2.35	.....	.....	.....	2.20@2.35	2.65@2.80
Mine-run	1.95@2.10	1.95@2.10	1.95@2.10	1.95@2.10	1.95@2.10	2.40@2.55
Screenings	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85	2.20@2.35
Washed slack	.....	.....	.....	.....	1.70@1.85	2.20@2.35

	Clinton and Sullivan	Knox and Greene	Eastern Kentucky	Pocah. and W. Va.	Penna.	Hocking	West Va. Splint
				Smokeless			
Dom. lump	$2.20@2.35	$2.20@2.35	$2.65@2.80	$2.25@2.40	$2.25@2.40	$2.60@2.75	$2.40@2.55
Steam lump	2.20@2.35	2.20@2.35	2.65@2.80	2.25@2.40	2.25@2.40	2.60@2.75	2.40@2.55
Egg	2.20@2.35	2.20@2.35	2.65@2.80	2.25@2.40	2.25@2.40	2.60@2.75	2.40@2.55
Sm'l. egg or nut	2.20@2.35	2.20@2.35	2.65@2.80	2.25@2.40	2.25@2.40	2.60@2.75	2.40@2.55
Mine-run	1.95@2.10	1.95@2.10	2.40@2.55	2.00@2.15	2.00@2.15	2.35@2.50	2.15@2.30
Screenings	1.70@1.85	1.70@1.85	2.15@2.30	1.75@1.90	1.75@1.90	2.10@2.25	1.90@2.05

MILWAUKEE

Increasing receipts of Illinois coal having an effect upon the market for Eastern bituminous grades.

The only new feature of the coal situation at Milwaukee is a steady increase in the consumption of Illinois coal, the demand for which has become so active as to disturb holders of Eastern bituminous, who are soliciting retailers to stand by them in return for their efforts to keep small dealers supplied with anthracite. Illinois lump sells for $6 and pile run and screenings at $5.75, while Pittsburgh lump is held at $7.25, pile run at $7 and screenings at $6.75. This condition will act as a check to any further advance in soft coal and may bring about a reduction.

Hard coal is held steady at $9.25 and $9.50, with an extra charge of 50c. for carrying in. Every dealer is loaded with orders and deliveries are being so apportioned that the supply will reach as far as possible. An error has been discovered in the compilation of hard coal receipts. Former figures noted an increase over last year of 79,040 tons up to Sept. 24. Corrected figures up to Oct. 1 show a falling off from last year of 30,868 tons.

Receipts of coal from the opening of navigation up to Oct. 1 were as follows: Hard, 546,380 tons; soft, 2,143,037 tons. Receipts during the same period in 1916 were: Hard, 577,248 tons; soft, 2,780,355 tons.

The Milwaukee County Council of Defense has issued an appeal to soft coal consumers to stock up, as every ton moved from the docks at present means that much storage space for additional receipts. Some yards have no coal except what is being received by rail. The yards that have been receiving coal by Lake are well filled up, however.

W. N. Fitzgerald has been appointed coal administrator by Dr. H. A. Garfield, Federal coal administrator. Upon Mr. Fitzgerald will fall the duty of fixing coal prices on the basis of Mr. Garfield's latest order, which became effective Oct. 1.

ST. LOUIS

Strenuous market on everything, with little of anything obtainable, excepting Standard. Car supply improved, but mines show decreased tonnage. Very little anthracite, and no smokeless coming in. Steam demand unusually good, and supply not equal to domestic call.

The demand for coal in the St. Louis territory is so far ahead of the supply at this time that most mines in the Williamson and Franklin county field are from five to seven weeks behind in shipments, and are not accepting any more orders.

This condition prevails in both steam and domestic sizes. Instead of increasing tonnages in this field, the mines show a slight decrease, owing to the miners refusing to work full time. Many mines have to suspend early in the afternoon on account of the miners refusing to continue work and this condition is general throughout the entire field.

There are some slight labor troubles here and there of temporary nature, but there is a wide-spread feeling of discontent among the miners that is apparently without reason.

In the Mt. Olive field conditions are much worse than in Williamson and Franklin county. Orders taken in July in this field for domestic business have not been shipped as yet. The labor troubles in this field have been pretty well settled, but tonnage is still short.

Coal from the Standard field continues to be in good demand, with little obtainable on account of the heavy railroad tonnage.

Mine production from this section shows up better than from the other two, but is still far short of the demand. The bulk of the tonnage from this field still continues to move to Chicago and the Northwest, and the demand for the domestic coal that has usually been sent to the Williamson and Franklin county and Mt. Olive fields is being taken care of from this field.

Car supply conditions throughout the entire field are a trifle better than 50 per cent. Transportation is slow, it sometimes taking two and almost three weeks for coal to move 100 miles on railroads in Illinois, and in St. Louis proper, delivery is retarded much the same way on the Terminal.

The American Railway Association is doing its best in some ways to keep coal cars in service by refusing the roads that own them to load them with ballast or other material, thus confining them strictly to the coal trade.

There is some anthracite moving in, but only on orders placed previous to Aug. 22. The anthracite tonnage for the Middle West moves through Eastern and Chicago jobbers, and they, in turn, have never been in touch with the trade in the Southwest and are not taking on any new customers. They will not split their commission with the St. Louis jobber, and as a result the country trade in the Southwest is without anthracite coal and with no hopes of getting any from now on.

With the cost of Williamson and Franklin county only 15c. above that of Standard f.o.b. cars in St. Louis and the delivered price of Williamson and Franklin county $1 a ton above Standard delivered to the customer, the dealers are pushing the higher grade fuel and they are almost refusing to handle the cheaper coal. This is working a hardship on the poorer class who cannot afford the high priced coal. The Government has not as yet taken any steps toward the regulation of price that should exist in different fields in Illinois and toward delivery in St. Louis. This hardship is going to grow as the winter approaches.

The retail price in St. Louis on the first of the month was:

Anthracite chestnut $11; egg and stove $10.75; West Virginia smokeless $9.50; Arkansas $9.50; Williamson and Franklin county $5; Mt. Olive $4.50; Standard $4.

The prevailing price per net ton f.o.b. mines is:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump	$2.35	$2.35	$2.35
3x6-in. egg	2.35	2.35	2.35
2x3-in. nut	2.35	2.35	2.35
No. 2 nut	2.35	2.35	2.35
No. 3 nut	2.35	2.35	2.35
No. 4 nut	2.35	2.35	2.35
No. 5 nut	1.85	1.85	1.85
2-in. scrgs	1.85	1.85	1.85
2-in. lump	....	....	....
3-in. lump	....	....	....
Steam egg	....	....	....
Mine run	2.10	2.10	2.10
Washed:			
No. 1	2.35	2.35	2.35
No. 2	2.35	2.35	2.35
No. 3	2.35	2.35	2.35
No. 4	2.35	2.35	2.35
No. 5	1.85	1.85	1.85

Williamson and Franklin county rate is 87½c. Other fields, 72½c.

Foreign Markets

ENGLAND

Reported by Hull, Blyth & Co., of London and Cardiff

Under date of Sept. 13, 1917

Coal—Market conditions remain unaltered.

	Fixed Regulation Prices
Best Welsh steam coal	$8.02
Best seconds	7.67
Seconds	7.48
Best dry coal	7.30
Best Monmouthshires	7.30
Seconds	7.05
Best Cardiff smalls	5.60
Cargo smalls	4.86

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The demand for tonnage continues pressing. Rates for unscheduled ports steadily advance.

Gibraltar	$24.30	Port Said	$42.50
Marseilles	21.78	Las Palmas	18.22
Genoa	24.60	St. Vincent	19.44
Alexandria	42.50	River Plate	27.32
Naples	23.86		